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ANNUAL REPORT

FISCAL YEAR

1977

RICHARD E. KENDALL
COMMISSIONER

INTRODUCTION

In accordance with Chapter 21 Section 3C of the General Laws I am pleased to submit the Report of the Department of Environmental Management for the Fiscal Year 1977. Enclosed are the individual reports of the Division of Forests and Parks, Division of Planning, Bureau of Solid Waste, and the Division of Water Resources which includes the Wetlands Restriction Program.

The Department has undergone serious administrative turn overs in the Office of the Commissioner during the past year. I am submitting this report as the fourth Commissioner or Acting Commissioner of the Department of Environmental Management to serve during the past twelve months. It is a tribute to the high level of professionalism and dedication of the Department's personnel that high quality of service continued to be provided by DEM.

I am extremely proud to be associated with this organization.

Geographic Involvement

The Bureau and Division reports graphically demonstrate the presence and impact of the Department across the Commonwealth. Our Department, with 863 authorized year round positions and 1,416 seasonal positions is one of the largest statewide employers of any state agency. Our $40,000,000 of bond authorizations places enormous responsibility on our planning staff, Acquisition and Construction personnel and upon the Division of Forests and Parks.

Our Department holds title to 250,000 acres in this State and accordingly accepts the role of managing this substantial amount of property. Land under our management stretches from the Atlantic Ocean Islands of Nantucket and Martha's Vineyard in the most easterly direction, to the New York border in the southwest tip of our State, to the Vermont border in the northwest, to the New Hampshire border in the extreme northeast tip of Massachusetts, to the Rhode Island border in the extreme southeasterly tip of the State and to the Connecticut border in the south central area of Massachusetts.

The Bureau of Solid Waste is providing leadership and technical assistance for Resource Recovery Facilities in four designated regions of the State as well as responding to other local and regional requests regarding solutions to the solid waste problem.

The Northeast Region project is well along with site selection and contract negotiations completed. Municipalities will go to a vote during the next six months on the question of formal contract acceptance.

Progress has also been made in seeking regional solutions for the Route 128 region, Central Massachusetts and the Springfield region in the west.

The Division of Water Resources continues to have flood control issues before it from across the State. The Division is now assuming a major role in water resource management planning on behalf of the Water Resource Commission. Their technical assistance will be called for in assisting the Commission in responding to the directives of Secretary Murphy that management plans be in place to insure both a quantity and quality of water sufficient to meet the needs of Massachusetts.

The Wetlands Restriction Program is working on both coastal and inland mapping and restriction implementation.

The Scenic Rivers Act will be implemented on the North River as our first completion. Scenic Rivers inventory has been completed and this also represents a statewide act to be implemented.

The Division of Forests and Parks is of course our largest unit in terms of personnel, property and services rendered. The Bureau of Recreation within the Division, provides recreation opportunities for the citizens of this State as well as hundreds of thousands of tourists from out of state and out of country. The Bureau of Recreation provides these recreation opportunities from the beaches of the Atlantic Coast to the mountains of Berkshire County. Substantial commitments are being made to urban park development as well as the more traditional rural and resort area park development. Progress at Lowell Heritage State Park and the Boston Harbor Islands Park are exciting and have drawn national review and praise.

The Department of Environmental Management's report is one of statewide initiative and service. We are pleased with the cooperation and assistance provided to us by all other state and local agencies, public and private alike, sharing our desire to provide the highest levels of service.

The Department also wishes to express its appreciation for the support and leadership provided by the Secretary of the Executive Office of Environmental Affairs, Dr. Evelyn F. Murphy.

Richard C. Kendall
Richard E. Kendall
Commissioner

TABLE OF CONTENT

DIVISION OF FORESTS AND PARKS

DIVISION OF PLANNING

BUREAU OF SOLID WASTE DISPOSAL

DIVISION OF WATER RESOURCES-(WETLANDS)

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF FORESTS AND PARKS
ANNUAL REPORT
FISCAL YEAR 1977
GILBERT A. BLISS, DIRECTOR

HIGHLIGHTS OF THE YEAR

The activities of the Division are manifested in the operation of programs associated with the four component Bureaus. These Bureau reports are prepared to highlight the progress of these various programs.

This past year has been one of growth, both in terms of new Division responsibilities and in terms of expansion of existing programs. The financial problems of the Commonwealth have not escaped us, however, and have provided a heavier burden of management responsibility in order to provide an acceptable level of service.

Highlights of the past year ranged from such diverse matters as an August hurricane which necessitated the prior evacuation of all state forest and park campgrounds, to the organization of coastal communities to provide a volunteer labor force in anticipation of oil spills from the broken hull of the Argo-Merchant.

The disposal of a beached dead whale at Salisbury, and the performance of Arthur Fiedler and the Boston Pops Orchestra at the Sampas Performance Center, within the Lowell Heritage State Park, bracketted the more serious problems of the preceeding paragraph, and only serve to demonstrate that this Division and its personnel are called on to deal with a continuing complexity of items related to the natural resource related matters of the Commonwealth.

MANPOWER PROGRAMS

The creation of funded programs, at the federal level particularly, designed to alleviate unemployment and stimulate interest in the environment have resulted in new opportunities for this Division. Major programs are as follows:

Youth Conservation Corps

In July 1976, the YCC entered its' second year of operation in the Commonwealth. The program, which employed over 300 youths between 15-18 years of age, was 80% federally funded and ran for the two month period of July and August 1976.

Federal funding for the program was in excess of $332,000.00 or 80% of the total project outlay. This expenditure represented a large increase from the first year in which approximately $40,000.00 was received from the Federal Government to employ some 40 youths.

The number of YCC Camps statewide likewise grew from a total of one the first year to eleven in fiscal 1977.

YCC enrollees are selected at random by computer from the names of youths who have applied. Once selected, the enrollee is assigned to attend a residential or a non-residential work camp.

YCC enrollees are paid on the basis of minimum wage for 30 hours per week of manual labor such as bridge building, trail construction, wildlife habitat improvement and like conservation projects. All such projects are performed on publically owned land only.

Four camps were operated on state forest and park lands by the Division and seven were operated on non-federal public lands by subcontractors. The Division views this as an expanding program with the summer program for 1977 (F.Y. 1978) funded at $598,000.00 with future increase anticipated. Coordination has been under the direction of Thomas Lavoie and Gerald Roosa.

CETA

Thirty-seven applications were submitted to consortium offices across the state by the Division. In addition to these, programs in Franklin County and at the Freetown Fall River State Forest were initiated in cooperation with other communities on levels of government serving as prime sponsors.

A special CETA summer program for youth was planned for the following locations:

CREW SIZE	LOCATION
10 - 2 supervisors	Pittsfield State Forest
10 - 2 supervisors	Robinson State Park - Agawam (Springfield) area
5 - 1 supervisor	Weymouth Nike Site
10 - 2 supervisors	Lowell Dracut State Forest
10 - 2 supervisors	Massasoit State Park - Taunton
10 - 2 supervisors	Harold Parker State Forest - N. Andover (Lawrence) area

Welfare Recipient Work Program

Several proposals were formulated relating to the gainful employment of individuals who are receiving welfare benefits. These proposals ranged from plans for placing over 2000 people (December 1976) to a pilot program, in late June, for the employment of approximately 15 people in Northern Worcester County.

Neighborhood Youth Corps

A number of communities, statewide, have placed, on both a full and part-time basis, Neighborhood Youth Corps crews on lands under the control of the Division. These programs have been in existence for a number of years, but were incorporated as part of the federal CETA program this year, and received increases in funding.

Mount Wachusett was an example where noticeable work results were accomplished.

ARGO-MERCHANT OIL SPILL

The break up of the tanker Argo-Merchant on December 21, 1976 resulted in the Division organizing coastal communities on a stand-by basis in order to provide a volunteer force to combat oil spill encroachment on the shoreline.

Communication points and local contacts were maintained until December 30.

Prior to December 21, (on December 17) a force of 30 Division employees was organized to respond, upon three hours notice, for possible transportation to Nantucket. This work force was not needed.

PERSONNEL CHANGES

This year was featured by major personnel actions within the Division involving both Boston office and field positions.

Director of Forests and Parks

Commissioner Evan Dobelle appointed Gilbert A. Bliss as the Director of Forests and Parks, in December of 1976. Bliss had previously served as Chief of Recreation since 1969, and was in the field service of the Division for 14 years prior to that, culminating as Regional Forest and Park Supervisor, in Berkshire County (Region 5).

Chief of Recreation

The position of Chief of Recreation was filled by Charles H. Dane. Dane served as Regional Forest and Parks Supervisor in Region I since 1972 and prior to that was stationed in central and western Massachusetts as a Service Forester and Regional Forest and Parks Supervisor.

Chief Forester

Kenton Beaujean was appointed as Chief Forester in November of 1976. Prior to that Beaujean had served as Assistant Chief of Recreation since 1972. His 24 year career with the Department has been involved in many field service and Boston office positions.

Regional Forest & Park Supervisor - Region I

The position of Regional Forest & Park Supervisor, in Region I, was filled by William Remes. Remes had served as Assistant Regional Forest & Park Supervisor since 1972, and prior to that had served at the Myles Standish State Forest. Remes appointment was made in January.

Assistant Chief of Recreation

Robert McLean was appointed to the position of Assistant Chief of Recreation in April of 1977. Prior to that, McLean served as Service Forester in Essex County and in southern Worcester County.

Marketing and Utilization Forester - Statewide

Thomas Quink was promoted to the position of Marketing and Utilization Forester in November of 1976. Quink was formerly Resource Conservation & Development Forester in the Berkshire-Franklin RC&D area, and prior to that was on the staff of the Department of Forestry & Wildlife Management at the University of Massachusetts.

The Division was strengthened by a series of 25 field appointments made to the position of Forest & Park Supervisor, as the result of a long anticipated civil service examination list. 18 of these appointments were to permanent and 7 to temporary year-round vacancies.

A landmark event in forestry circles, was the appointment in December of 1976 of Joanne D. Nunes, as a Forester within this Division.

Modern foresters are not all 200 pound chain saw specialists --- they are technically trained people who have spent years in study and experience, in order to carry out modern forestry practices. While Ms. Nunes is the first female forester in Massachusetts, a number of women work in this science in other states.

Joanne D. Nunes is a graduate of the University of Massachusetts, with a Major in Forestry. During the past year, she has worked as Camp Director in the Youth Conservation Corps in Franklin County.

LEGISLATION

Wachusett Ski Area

Legislation authorizing the Department to enter into a long term lease for construction and operation of an expanded ski facility at Wachusett Mountain State Reservation was finally enacted this year, after several years of futile attempts at passage. The Division looks forward to the completion of an up-dated management plan, as well as an environmental impact report to act as the necessary prerequisites to this long anticipated development.

Rink Fees Frozen

Over the objections of this Division, Chapter 311 of the Acts of 1976 was signed into law, to be effective on November 22, 1976. This law in effect required us to maintain rink hourly rental rates at the same level as was in place on January 1, 1976, and reduced the hourly rates on non-prime hours (12:00 midnight to 8:00 a.m., Monday through Friday) to $30.00.

This is the first case of legislative freezing or reduction of user fees and can only result in an increasingly deficit operation at all of our rink operations.

Hearings Held on Proposed Skeet and Trap Field

During fiscal 1977, a number of legislative and public hearings were held to consider legislation to allow a skeet and trap field to be constructed and operated at Wompatuck State Park, under the provisions of a long term lease utilizing private funds. The hearings allowed residents of the area and the general public to express their opinions on the proposal. The Joint Committee on Natural Resources & Agriculture held a special evening hearing in the Norwell Town Hall on February 24, 1977.

While the legislation was supported by many local and community leaders, others objected to the added traffic and what they consider a possible noise problem.

Shooting tests, conducted at the site, were almost undetectable at the nearest public road. Other objections were based on a fear that people will cut holes in the park fence - and leave their cars parked on the road - rather than use the park gate. The site where the range would be constructed is about one half mile from the nearest street.

The Department had studied several locations, and Wompatuck State Park was selected as the best possible choice due to its proximity to population centers and the availability of a remote location in the interior of the park.

Predictably, sportsmen were in favor of the proposal. The opposition was based on a fear of additional use of the state park, a question of sound and access through holes which have been cut in the fence on the Norwell side of the park.

As of this writing, final disposition of the question of development of such a facility remains in the future. A favorable report was received by the Joint Committee on Natural Resources and Agriculture.

PROGRAM REVIEW

The maintenance of communication between the Division administration in Boston and the field operations within each Region has long been an area in need of improvement.

Two methods of improving this situation have been installed in the past year.

It is the intention of the Director to conduct annual program reviews, generally lasting at least two days, in each administrative region. The format for these reviews involves a meeting, by Bureaus, with supervisory regional personnel and Boston personnel, including the Director. A free flowing discussion of all program matters, then follows and suggestions are noted by all involved.

At some point in the two day review, a meeting of all Regional personnel is held with the Commissioner and Director.

The initial Program Review was held in Region 3 at Clinton Headquarters on March 24 and 25. It was felt that the procedure was a success. Regions 4 and 5 were covered in April and May respectively. In Fiscal 1978, all Regions will be involved.

OUTSIDE CONTACTS

The tendency of a Bureaucracy to become enmeshed in its own, ever-increasing pattern of self-fulfilling and unresponsive procedures, is one which must be constantly guarded against. The diversity of interests and activities found in this Division make this a trap we do not naturally seem destined for, but must be ever mindful of.

The past year found the Division involved in and continuing relations with the following private agencies and organizations.

- Private Industrial & Consulting Foresters in regard to training and professional development.
- Massachusetts Association of Campground Owners in regard to the operation and maintenance of campgrounds and camping programs.
- Massachusetts Beach Buggy Association in regard to land use and beach erosion programs.
- Massachusetts Forest & Park Association regarding general forestry programs and Chapter 61 administration.
- Massachusetts Farm Bureau in regard to the state tree farm program.
- New England Kiln Drying Association (NEKDA) regarding identification of all lumber kilns in Massachusetts.
- Massachusetts Wood Producers' Association in aiding with closer utilization of the forest resource, thereby increasing efficiency and profitability.

- Northeast Retail Lumber Manufacturers' Association in identifying local producers of native lumber.

- Massachusetts Christmas Tree Association in culturing and marketing high quality Christmas trees on both a wholesale and retail basis. Helping to organize the 1978 National Christmas Tree Convention to be held at University of Massachusetts at Amherst.

- Greater Gardner Furniture Manufacturers in assisting to locate native species of furniture grade lumber and aid with locating other wood-using industries to use their waste wood.

- Friends of the Mill Village Inc. in regard to a continuing program of historical restoration at Moore State Park in Paxton.

- Lake Cochituate Watershed Association - Lake Management Committee, in regard to management of Cochituate State Park.

- Town of Carlisle, State Forest Advisory Committee in regard to activities at the former Farnham Smith Property.

- Coalition for the Preservation of the Lowell Dracut State Forest in regard to improvement of conditions in that area.

- Massachusetts Tree Wardens and Foresters Association whose membership is comprised of persons engaged in the field of Arborculture - particularly those concerned with public trees.

- Northeastern Forest Pest Council - five members each from northeastern states and Canadian provinces (Members named by respective state foresters.)

- Northeastern Forest Fire Protection Commission in regard to coordination of forest fire suppression and personnel training activities in the northeast and two Canadian provinces.

These contacts, maintained on a continuing basis, are a valid scale for measuring the effectiveness of our programs. The operation of Division programs is characterized by a high level of citizen participation.

Citizen advisory committees to assist us in the development and management of certain areas as well as in program related matters which have been established by the Department. At present, 36 committees are in existence.

The coordination of advisory committee activity is largely a Regional responsibility.

A listing of active advisory committees is as follows:

Region I

Borderland State Park Advisory Committee
Wompatuck State Park Advisory Committee
Martha's Vineyard State Forest Advisory Committee
Webb Memorial State Park Advisory Committee
Boston Harbor Islands State Park Advisory Committee
Regional Trails Advisory Committee
South Cape Beach Advisory Committee

Region II

Lowell Heritage State Park Steering Committee
Lowell Heritage State Park Interpretive Committee
Walden Pond State Reservation Advisory Committee
Plum Island State Reservation Advisory Committee

Region III

Wachusett Mountain State Reservation Advisory Committee
Regional Trails Advisory Committee

Region IV

Holyoke Range Advisory Committee
Regional Trails Advisory Committee

Region V

Mount Greylock State Reservation Advisory Committee
Otis Reservoir Advisory Committee
Regional Trails Advisory Committee

In addition, each of the eighteen skating rinks has an active advisory committee which assists us in conducting a program of use that accurately reflects the needs of the users.

Plans were under way by the end of Fiscal 1977 to establish regional advisory committees for forestry matters. These committees would play an active role in forest land management matters related to Division lands, as well as private land and product utilization policies and procedures.

BUREAU REPORTS

BUREAU OF FORESTRY	Kenton A. Beaujean, Chief Forester
BUREAU OF INSECT PEST CONTROL	Charles S. Hood, Chief Superintendent
BUREAU OF FIRE CONTROL	Sidney G. Thompson, Jr., Chief Fire Warden
BUREAU OF RECREATION	Charles H. Dane, Chief of Recreation

ANNUAL REPORT

FISCAL YEAR 1977

BUREAU OF FOREST DEVELOPMENT

KENTON A. BEAUJEAN, CHIEF FORESTER

In general, the Bureau has had a good year. We were at least able to hold the line budget-wise, and though everyone had to put out extra effort, most of the goals have been met. Probably, one of the most notable happenings was the Forestry Program Review Board established by the Secretary for the purpose of Reviewing all programs dealing with the forested lands of the Commonwealth. This Review Board was chaired by Dr. Ernest M. Gould, Jr., Forest Economist for Harvard University. The final report was presented to the Secretary on June 15, 1977.

This report is broken down into four separate sections, each covering the primary activities of the Bureau, the Administration activity covering the administrative functions, Service Forestry dealing with management of private lands, State Land Management dealing with the management of forested lands under the control of the Division of Forests and Parks, and the Marketing and Utilization activity which deals with the marketing and utilization of forest products and services, including the efforts of the Rural Conservation and Development Projects.

Administration

Most of the personnel changes are covered in other parts of this report, but for the most part, all positions are now filled, and it looks as though it will remain stable for the foreseeable future. Organizationally, as described under the Service Forester Section, the Bureau is as strong and well informed as it has ever been.

The U. S. Forest Service held a program review this past April and the Bureau of Forest Development participated in this. During this period, the Chief Forester together with other members of the staff, discussed various parts of the programs in which we cooperate with the federal government. Trips were also made into the field to view the program in operation. Both landowners and industry were visited. In addition to the Program Review, an audit by the U. S. Forest Service was made, in order for them to check on our use of federal funds. With a few minor exceptions, everything was found to be in order.

Bi-monthly training meetings have been held in conjunction with private forestry consultants. These meetings have been quite well attended, and a good dialogue has been established between our foresters and the consultants. These meetings will continue in the future.

A step up of activity relative to the Forest Cutting Practice Law was initiated this past fall, and the results of this are now beginning to show. It is hoped that in the final analysis that this law will serve to answer the requirements of other federal and local laws which pertain to the environment.

Chapter 61 and Chapter 61A certificates have been processed (see statistics Service Forestry) showing a slight increase. However, all signs, 100% valuation by communities, point toward this activity really increasing during the ensuing years.

As a result of our experiences and the Forestry Program Report, several changes and/or additions to laws should be made this coming year. They are as follows:

a. The Forest Cutting Practice Law, Regulations and the size of the Forestry Committee.
b. Slash Law relating to the disposal and/or treatment of material.

c. Forest Land Classification Law Chapter 61 in order to bring it more in line with Chapter 61A.
d. Forester Registration Law.

Of the above, probably the most significant would be to propose a Forester Registration Law which would insure landowners that they are receiving the best possible advice from private forestry consultants.

A registration law would also make it possible to shift more responsibility to the landowner relative to the preparation of plans in accordance with Chapter 61, 61A and the Forest Cutting Practice Law, Chapter 132, Sections 40 - 46.

Legislation

Supportive testimony with proposed amendments was presented to the Committee on Natural Resources & Agriculture relative to Senate Bill 1417, relative to notification of certain individuals, relative to lumbering operations. The legislation was passed with our recommendations. The provisions of the legislation were adopted as policy by the Division, prior to the passage of the act.

This legislation provides for notification of local communities, prior to conducting wood product sales on Division lands.

The Bureau provided support for a bill dealing with revision of Chapter 61, as well as the establishment of a Forestry Study Commission. Both of these pieces of legislation remain unpassed at the close of the fiscal year.

Service Forestry Program

Personnel

The past year has seen quite a changeover in the assignments of Bureau personnel. In June, the Acting Chief Forester transferred back to the field to cover Bristol-Norfolk County and the result of this action was as follows:

Assistant Chief of Recreation moved to the Chief's position;
Bristol-Norfolk County forester to Essex County;
A new forester was hired to assist the Chief in Boston.

In April, the process started again when the Bureau lost the Southern Worcester County forester to the Bureau of Recreation. The Eastern Franklin County forester immediately transferred to Southern Worcester, and a new forester was hired to occupy the Eastern Franklin position.

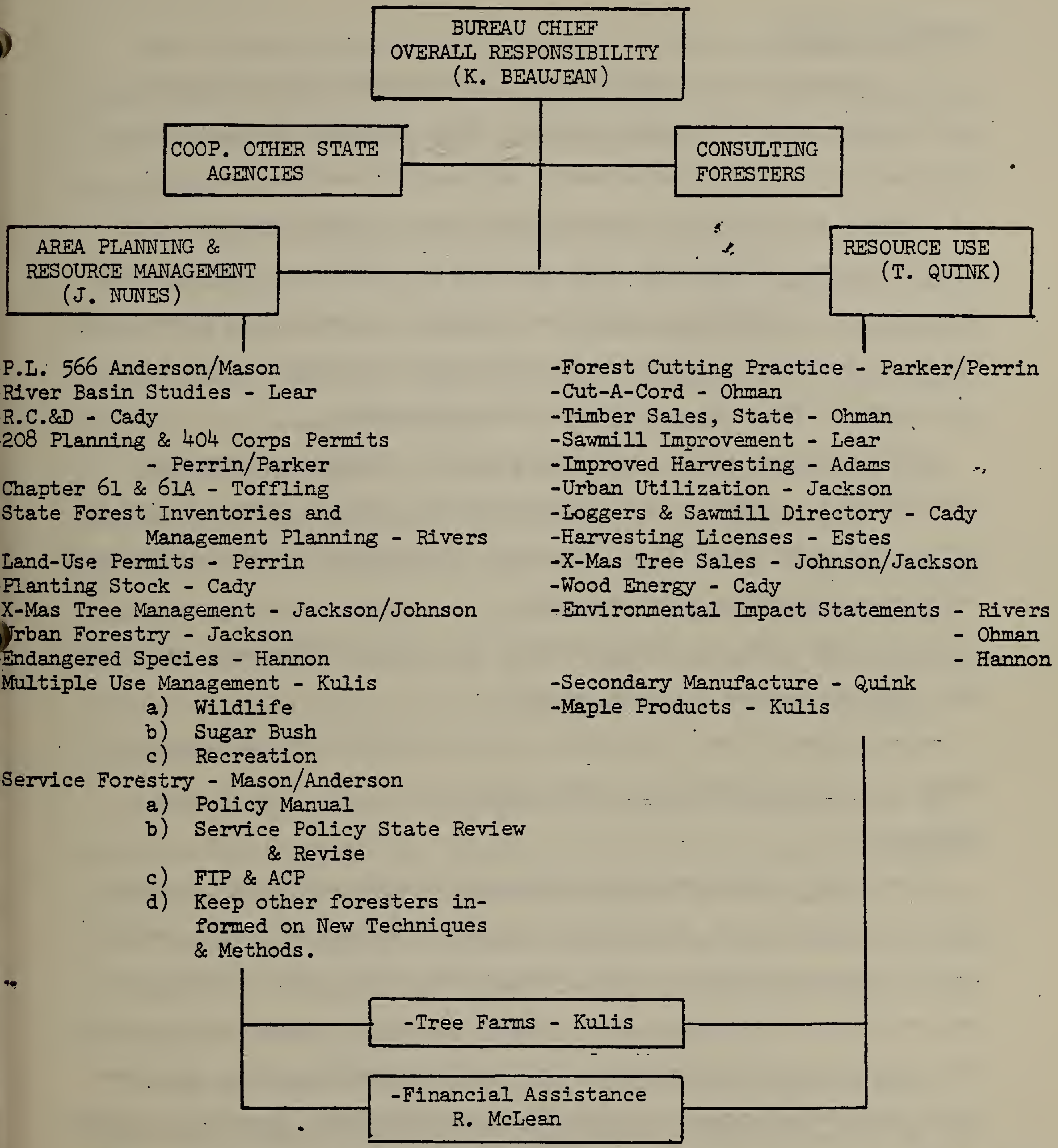
With this change in personnel came also a change in the Bureau's organization. Each of the foresters, both service foresters and management foresters were given a statewide assignment(s) in a particular area/program that the Bureau is directly involved in, such as River Basin Studies, 208 Planning, Christmas tree management, and sales, urban forestry, harvesting licenses, and so forth. The areas of specialization were divided into two main groups - Area Planning and Resource Management, and Resource Use. The Norfolk County forester was assigned to over-see the statewide program activities under the former group, and the Marketing and Utilization forester was directed to over-see the latter group of activities. (See organizational chart attached.)

In general, the responsibilities associated with each assignment were:

1. Review and become familiar with existing statutes, regulations, policy and programs that are applicable, and determine their effects on our own programs.
2. Attend statewide meetings relative to the assigned program.
3. Update existing records, files, etc., at state and regional levels.
4. Assist in presenting information at meetings in each specific area relative to changes in procedures and/or policy.
5. Coordinate all statewide activities with the objective of bringing consistency to the program.

At this writing, the reorganization of the Bureau is still in the process of change, but we believe that eventually it will allow the Bureau to run more efficiently and effectively.

STATEWIDE ASSIGNMENTS
MASSACHUSETTS BUREAU OF FOREST DEVELOPMENT



-P.L. 566 Anderson/Mason
-River Basin Studies - Lear
-R.C.&D - Cady
-208 Planning & 404 Corps Permits - Perrin/Parker
-Chapter 61 & 61A - Toffling
-State Forest Inventories and Management Planning - Rivers
-Land-Use Permits - Perrin
-Planting Stock - Cady
-X-Mas Tree Management - Jackson/Johnson
-Urban Forestry - Jackson
-Endangered Species - Hannon
-Multiple Use Management - Kulis
  a) Wildlife
  b) Sugar Bush
  c) Recreation
-Service Forestry - Mason/Anderson
  a) Policy Manual
  b) Service Policy State Review & Revise
  c) FIP & ACP
  d) Keep other foresters informed on New Techniques & Methods.

-Forest Cutting Practice - Parker/Perrin
-Cut-A-Cord - Ohman
-Timber Sales, State - Ohman
-Sawmill Improvement - Lear
-Improved Harvesting - Adams
-Urban Utilization - Jackson
-Loggers & Sawmill Directory - Cady
-Harvesting Licenses - Estes
-X-Mas Tree Sales - Johnson/Jackson
-Wood Energy - Cady
-Environmental Impact Statements - Rivers
- Ohman
- Hannon
-Secondary Manufacture - Quink
-Maple Products - Kulis

-NOTE: WHEN TWO OR MORE PERSONS ARE ASSIGNED TO ONE PROGRAM, THE PROGRAM LEADER'S NAME APPEARS FIRST.

Chapter 61 and 61A

The Bureau saw a slight increase in the number of new Chapter 61 applications for certification this year. This voluntary law applying to 10 acres or more of woodland valued at not over $400 per acre, requires one to begin managing their woodland before they can take advantage of it. It also requires the woodland owner to adhere to a five year plan of forest management, "to improve the quality and quantity of a continuous forest crop." For this, the owner is allowed to have his land taxed under a lower forest use valuation rather than a high real estate valuation.

During the year, 63 new management plans were written up covering 4,741.62 acres. Hampshire County topped the list with 19 plans for 1,139.80 acres. With towns presently in the process of revaluing to 100%, a substantial increase is expected to occur next year.

At the same time, 74 recertifications for 8,550.13 acres were issued this year, covering another five-year period.

Since Chapter 61 went into effect, we have certified 52,126.19 acres of forest land for management under this program.

Statistics

Through the Cooperative Forest Management Program with the U. S. Forest Service (C.F.M.) and the federal Small Watershed Program (P.L. 566), our 12 service foresters helped over 2100 woodland owners with their problems on over 60,000 acres of forest land. Assistance includes, but is not limited to, such things as writing management plans, how to plant, wee, thin, and prune trees, care and maintenance of Christmas tree plantations, sugarbush management and maple syrup production, wildlife habitat and recreational development, and insect and disease problems.

These foresters helped find a market for 12 million board feet of timber and 817 cords of wood. Under these programs this year, Massachusetts received $7,017.00 in C.F.M. funds and $14,756.00 in P.L. 566 funds.

Tree Farms

Those forest landowners who have shown they are doing a good job of forest management are entitled to a Tree Farm sign and a certificate issued through the American Forest Institute, a private organization sponsored by the large paper and lumber company industries throughout the United States. This year, our foresters inspected 103 tree farms.

Other programs sponsored by the Mass. Tree Farm Committee include the running of the Tree Farm Booth at the Eastern States Exposition in Springfield, Mass., in September. Our foresters, as well as other foresters, throughout the state, explain the principles of forest management to those who visit the booth. An estimated 35,000 people visited the booth this year. Also, at the Exposition, the Outstanding Tree Farmer of the Year Award is presented.

Thanks to the American Forest Institute's Policy of paying $10.00 for each Tree Farm inspected, our foresters have been able to enjoy the benefits of having work-study students from the University for the summer, at no cost to the State. By inspecting a certain number of tree farms during their term of employment, the work-study students actually earned the 20% to be paid by the sponsor, with the University picking up the other 80%.

During the summer, the students assist the foresters with tree farm inspections, Chapter 61 Management Plans, marking timber, etc., freeing the foresters to do other things.

Society of American Foresters

The Bureau this year has begun to be more involved with the Society of American Foresters, the professional society of foresters. We, and other groups of foresters, are attempting to change the emphasis of the society from research and academic to a more practical orientation. In March, the Bureau sent 10 foresters to the New England Section Annual Winter Meeting to participate in the concurrent session and emphasize the feelings of the Bureau.

Meetings

The foresters were involved in numerous workshops and meetings this year. The Bureau has initiated a series of by-monthly training-informational sessions for our foresters, as well as any private foresters, and would-be foresters, that are interested in attending. The sessions began in February, and thus Far, have had very strong support in terms of attendance with an average of 40 - 45 people attending each meeting. Topics discussed at the sessions this year include Chapter 61, The Forest Cutting Practices Law, The New Foresters Policy Manual, and a discussion of how the state and private foresters can best cooperate on mutual problems.

Throughout the state, numerous Christmas tree and forestry field days are held during the year. Our foresters take an active part in these workshops, explaining the principles of Christmas tree and forest management, and answering questions.

Other workshops in which our foresters took an active, if not principal part, include a wood cutters workshop, numerous wood energy workshops, and various educational talks and field trips with local school and college groups.

Special Projects

The Northern Worcester County forester has been involved with Chapter 61 this year. He is working diligently to make the system run smoother. Since December, he has devised a new application form, new management plan form, including the signatures of the Regional Supervisors, Chief Forester, and Director, and a new certificate. He is presently in the process of drawing up very specific procedures for the forester, landowner, and assessors. It is a long, hard climb, but we hope this will eliminate the question, "Now What Do I Do?" that we receive quite often.

The Hampshire and Plymouth County foresters, along with assistance from the Norfolk County forester, are working on the development of an open "Forester's Policy Manual." This manual is aimed primarily at a new forester coming into State Service, and covers aspects of both service forestry and management forestry, but it will also serve to refresh the memories of those who have been around for a number of years. The manual will include such things as organizational charts, motor vehicle procedures, industrial accidents, and the various statutes that the Bureau deals with. Expected completion of the rough draft is September, 1977.

STATE FOREST MANAGEMENT

Background

At least 75% of the 250,000 acres of forests and parks under our administration are capable of growing and harvesting wood products without interfering with other multiple forest uses such as recreation, aesthetics, water, and wildlife. We have three foresters, each with one assistant to plan and carry out forest management and maintenance details on these lands. It is almost an impossible task even with a very small help from the few forest crews that are not wholly tied up with recreation maintenance year-round.

Boundaries

With over 1500 miles of state forest and park boundaries, it is a constant job to inspect and maintain them by brushing out, painting and placing special boundary markers at strategic points. Only 100 miles of boundaries were maintained this year. This is not nearly enough, as they should be covered at least once in 10 years.

Timber Sales

The foresters marked 2,347,000 board feet of timber, and 710 cords of wood during the course of the year. Sale of forest products brought revenue of $69,367.00 to the State.

Planting

Over 5,000 white pine seedlings were planted on the Freetown State Forest this year, in an attempt to change the species composition of a poor quality oak stand to a higher quality pine stand. The planting, along with 2 acres of direct seeding, took place on a Cut-A-Cord area of the forest, and was accomplished by a very hard-working C.E.T.A. crew.

Environmental Impact Statement

Work on the revision of the Environmental Impact Statement on forest management policies on state lands commenced this year. Included in the Statement will be a breakdown of "Protection Areas" for state lands. The rough draft of this document is expected to be completed in December of 1977.

Continuous Forest Inventory

This year saw the re-inventory of the State's forest resources. With the assistance of personnel at the University, and the use of their computers, we will be able to estimate our annual allowable cut (cut equals growth in any one period.) Completion of this project is expected to be in early fiscal year 1978.

Martha's Vineyard Salvage

The forest on this island isolated from the usual wood industries, had, in the late twenties and early thirties, been planted with Red, White, and Scotch Pine on over 800 acres of its previously completely burned over land. For years, these plantations have gradually been slowing down in growth, due to overcrowding of the closely planted trees, and recently were found to be infected with Diplodis spp, a canker-causing fungus. It seemed wasteful to kill or cut trees to thin these plantations without an outlet for this material. Vineyard Pine Lumber Company, Inc., which is owned and operated by a forester and native of Martha's Vineyard and is the only sawmill on the island, offered to buy the material taken out in the thinning process. This material will then be turned into square-edged stock for use in landscaping.

Insect Hits Franklin County Trees

An infestation of Oak Leaf Tier was discovered in the Wendell State Forest earlier this year. Since then, the insect has been found on all State land in Franklin County. A survey is presently underway by crews in the Bureau of Insect Pest Control to determine the extent and seriousness of the infestation.

Cut-A-Cord

During the energy crisis of 1973-74, oil was in short supply. As a result, many people began burning wood as a supplementary or alternate source of energy. On December 13, 1973, in response to the fuel shortage, Governor Sargent directed that a "Cut-A-Cord" program allowing the cutting and/or gathering of dead wood on state forests, be instituted immediately, to help avoid the imminent threat to public health and safety posed by the energy crisis.

The FPM&U program in Massachusetts is aimed at assisting private forest landowners, timber operators and processors of forest products. Assistance includes technical service and advice on harvesting processing and marketing of forest products in a manner that will more efficiently and completely utilize all forest products, simultaneously protecting and improving the quality of the Commonwealth's natural environment.

Though the program is nearly three years old, FY 1977 was the first year in which full-time efforts of a specialist were devoted to pursuing its overall objectives. Previously, the Resource Conservation and Development (RC&D) forester allocated a portion of his time to achieving those ends. Presently, the RC&D project is also oriented toward marketing and utilization of forest products and complements the FPM&U program.

ACHIEVEMENTS IN THE AREA OF FOREST PRODUCTS MARKETING AND UTILIZATION

.. Together with the RC&D Forester and U.S.D.A. Forest Service - State & Private Representative, developed the "Forest Products Marketing & Utilization Analysis for Massachusetts." Said analysis has been critiqued by various in-state forest products interests and is in its final stages of completion. It will be used to guide the Division's FPM&U Program, designed to optimize opportunities for communication, education and service between segments of the forest products industry, related professions and industries, and the general public, and noncomitantly provide a planned approach to making fulland best use of our Commonwealth's total forest resource with complete regard for the natural environment.

The following is a breakdown of the Cut-A-Cord Program by fiscal years:

	1974		1975		1976		1977	
REGION I	$2,008.00	1,004	$2,702.00	1,351	$4,258.00	2,129	$9,659.00	3,232
REGION II	2,560.00	1,280	792.00	396	1,734.00	867	3,183.00	1,094
REGION III	224.00	112	432.00	216	878.00	439	1,933.00	636
REGION IV	61.00	30	70.00	35	454.00	227	1,548.00	372
REGION V	48.00	24	94.00	47	696.00	348	1,473.00	493
TOTALS	$4,901.00	2,450	$4,090.00	2,045	$8,020.00	4,010	$17,796.00	5,827

Management Forester Conrad Ohman completed a draft report in May, relative to a report reviewing the three years of program operation. This report, in final form, will be utilized to guide the continuance of the Cut-A-Cord Program in Fiscal 1978.

Other Projects

The management foresters were involved in other projects this year as well:

1 - Forty-eight (48) acres of timber stand improvement on State land was accomplished this year.
2 - Two (2) acres of wildlife habitat areas were established.
3 - Thirty-eight (38) acres of fire hazard reduction work was accomplished.
4 - Four (4) forest management demonstration plots were established; two one-acre plots were established at Willowdale State Park, and two half-acre plots were established at Myles Standish State Forest.

Marketing and Utilization

The Forest Products Marketing and Utilization (FPM&U) Program involves the harvesting, processing, and marketing of wood from the stump to the finished product. Direct beneficiaries of this program are woodland owners, loggers, wood processors and their employees. All persons who supplement their energy needs with wood also benefit. Entire communities and areas share in the benefits through increased business, higher employment, a more stable tax base, and a protected and up-graded environment.

.. As the Division's Representative (upon the request of the Director) to the Commonwealth's two RC&D (Resource Conservation & Development) Project's, advised and assisted in formulating annual work plans, dealing extensively with the utilization and marketing of forest products from the stump to the finished product. Both projects heavily support the Marketing and Utilization Program. As a result, was invited by the State of Connecticut's King Mark RC&D Project (northwestern Conn.) to help establish a forestry advisory Committee. The committee was established and recently an RC&D forester hired! Plans are to have cooperative regional forestry-related projects between Massachusetts and Connecticut.

.. Coordinated and processed the sale of all forest products harvested from lands under the Division's jurisdiction. Timber sales were not up to par primarily because of severe winter storms which impaired foresters to mark timber, and caused severe blow downs of timber which had to be salvaged at very low stumpage prices, stemming from a flooded market. Income from the sale of timber amounted to $47,700.00.

.. Together with the RC&D Forester, participated in various informational programs dealing with wood as a supplementary energy source. These included: the drafting of an article, "Wood Heat: Ecology and Economics", which appeared in state-wide newspapers; three presentations of "Wood As An Energy Conservator, or Why Use Wood" at wood energy workshops totalling of nearly 800 attendees; and counselling of clientele requesting information on procuring, harvesting, processing and burning fuelwood.

.. Coordinated, upon request of the Director, the delineation of "Protection" areas on all lands under the Division's jurisdiction. These areas, for various reasons, will be excluded from the harvesting of timber products.

.. Coordinated the updating of procedures for implementing the Forest Cutting Practices Law (Ch. 132, Secs. 40-46), informed foresters, loggers and sawmillers of these changes, and assisted the Chief Forester in actual implementation. Harvesting licenses, as mandated by Section 46, were thoroughly reviewed, and applications sent to all known loggers operating in the Bay State and to those sawmill contractors who have their own logging crews. Sale of 215 licenses reflected a substantial increase over FY 1977 and yielded an income to the General Fund of $1,880.00.

.. Coordinated the Division's Fuelwood Program .... a supplement to the escalating fossil-fuel costs. Under this program, the Cut-A-Cord Program was reviewed after three years of operation, and recommendations made by Regional Supervisors and Foresters in upgrading that program in FY 1978. The Commercial Fuelwood Program was also expanded and resulted in several new firewood dealers, some formerly unemployed and on public assistance, to get into business and off unemployment rolls. Jointly, both programs yielded an income to the Commonwealth of nearly $22,000.00.

mentioned businesses. Also, a greater demand for these products will increase the demand for timber from Massachusetts' forests, thereby directly contributing to the state's economy.

.. Supervised a work-study student from the Wood Science and Technology Section, Dept. of Forestry and Wildlife Mgt. - U. Mass., Amherst, in a survey of secondary wood industries in the four western Massachusetts' counties. Continued work on this project is anticipated to survey the entire state and data will allow the coupling of primary and secondary wood industries, thus encouraging use of local wood products.

.. Coordinated/encouraged the marketing of locally-grown Christmas trees by determining location of growers and the consumer-preferred species. Encouraged marketing of these trees by in-state retailers rather than of those produced out-of-state, particularly northern New England. The annual potential market for all-size, all-age, high-quality, cultured trees is about 1.2 million with local growers presently filling about 15% of the demand.

.. Aided maple products industry, which is closely coupled with tourism, to expand marketing (retail and wholesale) of their products. Keep the industry informed on retail outlets that sell ample amounts of out-of-state produced products, and encourage them to capture these markets.

.. Visited, together with the Bureau's service forester, most sawmill operations in the state. Advised sawmillers on Forest Cutting Practices, stress-grading of lumber as required by Mass. Building Code Commission, and new markets and techniques for their products.

.. Cooperating with the Extension Service's Sea Grant Program, found sources (wood-preservative companies) for about 1100 pilings needed to replace those damaged by severe winter storms. Helped market/utilize the used pilings by contracting landscape contractors and fuelwood dealers.

.. Supervised the updating of the "Massachusetts Directory of Sawmill Operators and Loggers - 1975." The updating is a biannual cooperative task between the Division and the Massachusetts Cooperative Extension Service. The Directory, to be published in late 1977, will be available to the general public and will assist private woodland owners with the sale of their forest products. It will become more important as woodland owners subscribe to the Massachusetts Forest Tax Law, Chapter 61.

.. Met with top management from a large-international forest products industry to discuss/determine the feasibility of their investing in composition-board industry in the Bay State. Results were somewhat negative, since the new-housing market is depressed in the Northeast.

.. Participated in the Northeast Retail Lumbermen's Association annual convention in Boston and promoted the use of Massachusetts' grown and milled lumber, thereby discovering new markets and contacts for our primary processing industry.

.. Advised Northeast Utilities - Northfield Pump Storage Project - on marketing over 3,000 cubic feet of unbarked wood chips. Compiled and analyzed data on present and future feasibility of helicopter logging in Massachusetts/New England.

.. Participated in the Berkshire County Conservation District's Winter Meeting by addressing the subject: "Composite Wood Products-Utilizing O$\overset{U}{u}$r Underused Resource."

.. Began an inventory of products produced by the in-state primary forest industries. The project will continue into FY 1978 and the end result will be a directory which will inform secondary woodworking industries, retail lumber yards, and specialty-products firms where and from who to acquire locally grown/milled products. It is anticipated that this liaison will reduce long out-of-state transportation costs and increase the profitability of all afore-

.. Represented the Office of the Secretary of Environmental Affairs at the "Towards Tomorrow" Fair at U. Mass., Amherst, primarily dealing with wood energy. Presented a talk entitled, "Government's Role in Managing New England's Fifth Forest," and participated in a related panel discussion.

.. Worked with secondary wood-using industries, principally furniture manufacturers in the greater Gardner area, in alleviating their wood-residue burning problems and conversion of some of these by-products into higher value furnish for other industries. Am anticipating to work cooperatively with the U.S.D.A. Forest Service on its computer-based Rough-Mill Improvement Program (RIP) which will increase companies' profitability through the analysis of their cutting procedures and increased efficiency in lumber-purchasing procedures. This program will continue into FY 1978.

.. Assisted an entrepreneur interested in establishing a charcoal briguetting industry in Massachusetts with information on the availability of wood residues.

.. Assisted a wood products company with developing resource data on the availability of wood by-products from processing and forest management operations. These by-products would be mechanically pressed into "fireplace logs." Said company is continuing to explore this feasibility.

.. Appointed by the Secretary of Environmental Affairs to serve as Chairman of the Forest Products Committee, Massachusetts Forestry Program Review Board. Results were a comprehensive report incorporated into the FPRB final report.

.. Together with a representative from the Massachusetts Dept. of Commerce and Development, aided a sawmiller to overcome a problem with the local utility company in extending necessary electrical power for the modernization/ expansion of his business.

.. Upon request of Sturbridge Village management, advised on the rehabilitation of a historic sawmill. When in operation, the mill will be an integral part of the Museum's program and will emphasize our nation's wood-based heritage.

ANNUAL REPORT

FISCAL YEAR 1977

BUREAU OF INSECT PEST CONTROL

CHARLES S. HOOD, CHIEF

The words "Environmental Management" denote a vast range of endeavor. The Division of Forests and Parks bears the responsibility for that part of the environment concerned with trees. The two categories of trees receiving attention from the Division are those designated forest and those designated shade. Of major concern in the management of trees are the periodic attacks by certain insects and diseases. Responsibility for the survey and detection of these tree pests rests in the Bureau of Insect Pest Control. It is also the responsibility of the Bureau to determine the extent and severity of an outbreak and to predict the short and long term effect on the trees. Upon reaching this determination, it is then the responsibility of the Bureau to use or to recommend the most efficaceous means of suppressing the pest.

Over the years, due to the nature of insect and disease control, the Bureau has taken on other closely related programs. Rats had always been a minor problem on Forest and Park areas, until the acquisition of the Boston Harbor Islands. Suddenly we were confronted with a major problem. On the other hand, mosquitoes have always been a problem on our park and recreation areas, and have for years been controlled by Bureau personnel and equipment. Our bodies of water, due to natural eutrophication and that aggravated by the addition of nutrients, need periodic control measures to cut down on the aquatic weeds and algae which interfere with swimming and boating. Control of the Dutch Elm Disease is most efficient with the prompt removal and destruction of diseased elms which if left standing, are focal points for further spread of the disease. To help combat the disease, the Bureau has four crews trained in the removal of the diseased trees. Due to their skills in tree work, they have been found to be very useful in the maintenance of trees on the recreation areas.

An unusual program outside normal Bureau functions was culminated during this fiscal year. As had been reported in previous years, the Department had collected and put in storage in bunkers at Wompatuck State Park, 260 tons of unwanted pesticides. This year saw the complete removal of these pesticides, not only from the Park but from the State.

The start of each fiscal year coincides with the program time to conduct the annual aerial survey for the purpose of determining current defoliation, particularly that of the gypsy moth. In July of 1976, the survey required 25.5 hours of flying time to cover the state.

Results of the aerial survey indicated an almost twofold increase in visible gypsy moth defoliation in 1976, over that noted in 1975. The total 1976 gypsy moth defoliation was 31,720 acres as compared to the 1975 defoliation of 17,895 acres. Most of the increase took place in Bristol and Norfolk Counties, although some increase in the town of Sturbridge was noted.

Of particular interest in the 1976 aerial survey was an area in the vicinity of the Erving and Wendell State Forests. Insect activity had been noted earlier, and some adults of a small moth were collected and sent to the National Museum of Natural History for identification. They were identified as Croesia semipurpurana, common name, oak leaf tier. The aerial survey indicated approximately 30,000 acres as visibly defoliated by this insect.

As this insect is an early feeder, its larval stage being completed by the end of May, a second aerial survey was conducted during this fiscal year. On June 13, 1977, five hours of flying indicated a total of 100,665 acres of defoliation which could be attributed to this insect. It extended from the towns of Northfield and Warwick south to Belchertown. To the west of this area, and running from Charlemont down to Westfield, appeared a line of individual defoliated areas. Random checking on the ground confirmed the presence of the oak leaf tier.

Fall webworm was again prevalent throughout the State, confining its feeding primarily to wild cherry along the roadsides. Many inquiries were made both to the Boston office and to personnel in the field, by citizens alarmed by the numbers of nests and the appearance they created. Most of their fears were alleviated when it was explained that little or no permanent damage would be sustained by the trees.

The gypsy moth continues to be troublesome, particularly in Bristol and Norfolk Counties, where the communities of Mansfield, Sharon, Easton, Norton, North Attleboro, and Attleboro were sprayed aerially to give relief to residents. The current outbreak in this area is the first since the early 1950's. Considerable spraying with ground equipment was also conducted in Rehoboth, Sharon and Wrentham.

Dutch Elm Disease

During the course of the year, Bureau personnel assisted 93 communities in the removal of 1,656 Dutch Elm diseased trees. They assisted 106 communities in the sampling of elm trees suspected of having the disease, reaching a total of 1,925 trees sampled.

Bureau activity in this program is extremely important when viewed on a statewide basis. Those trees removed can no longer act as focal points for further spread of the disease, as the beetles which spread the disease are no longer afforded a breeding area. More important, however, is the incentive this city and town assistance program gives the communities in encouraging their further participation on the local level.

Another Bureau function in the total Dutch Elm Disease control effort is that of coordinating the efforts of certain counties in the monetary assistance to communities having demonstrated a sincere concern for the problem. During the past fiscal year, three counties - Bristol, Worcester, and Berkshire - participated in this program for a total of $35,000.00. This money was allocated to those cities and towns having conducted Dutch Elm Disease programs satisfactory to the Bureau and according to the amount of expenditure incurred by each. Here again, the incentive was as important as the money.

Gypsy Moth

We are in a period of rising gypsy moth populations. From a low of 17,000 acres in 1975, we are faced with a total of approximately 150,000 acres as indicated by the 1977 aerial survey. A total of 26 communities, with the major portion of these in Bristol and Norfolk Counties, showed visible defoliation from the air. Spot checks on the ground indicate that perhaps double the amount of acreage shown to be defoliated also has rising gypsy moth populations.

In an effort to enhance the present parasite predator complex, the Bureau has been cooperating with the U. S. Department of Agriculture in the release of parasite species not now present in Massachusetts. Approximately 5,000 individuals comprised of three different species of parasites, *Exorista lavarum*, *Palexorista inconspicua*, and *Apanteles liparidis*, were released in selected areas during FY 77. The parasites released were all parasitic on the larval form of the gypsy moth. Each of the above-named parasites are polyphagous, having the ability to survive on alternate hosts when gypsy moth populations are low. The release sites will be checked yearly for evidence that one or all of the species has become established.

Oak Leaf Tier

This is a native insect which periodically breaks out into epidemic proportions in areas heavily populated with red oak. Oak of the white oak varieties growing in the same areas are not attacked. Past histories of outbreaks, the last major one being in Pennsylvania, indicate that severe mortality to the red oak can result.

At the present time, a severe outbreak is in progress in Massachusetts. The first indications were noted in 1975, when light defoliation was seen in the area of the Erving-Wendell State Forests. Examination of captured moths indicated that the defoliator was *Croesia semipurpurana*, the oak leaf tier.

The general aerial survey conducted in July, 1976, for the purpose of detecting gypsy moth defoliation detected an area of approximately 30,000 acres in the northeast portion of Franklin County. A later ground check revealed small, flat, circular eggs on the two year old branches. These were eggs of the oak leaf tier. Concerned that large numbers of eggs were present, and aware of this insect's potential killing power, Bureau personnel contacted the U. S. Forest Service. Plans were made to monitor the outbreak with the intention of collecting data for the purpose of preparing an environmental inpact statement.

Plots were established in known areas of infestation, with accompanying check plots outside the generally infested area in an attempt to determine the impact of this insect on the red oak. Recently, the U. S. Forest Service has developed a somewhat simple, visual method of determining the starch content in the roots of deciduous trees, particularly oak. Normally, starch is stored in the roots to be changed to sugars in the spring, to aid in the growth. A tree under stress from such things as drought, insect defoliation, etc., cannot store the proper amount of starch.

A low starch content is a good indication that the tree is in trouble and more stress will kill it. Hopefully, the tests will give us an insight into the possible danger of continued defoliation.

In June of 1977, following extended and heavy larval feeding, a special aerial survey was conducted to determine the extent and severity of the feeding. At this time, it was determined that 100,665 acres of red oak were moderately to heavily defoliated by the oak leaf tier.

Fall Webworm

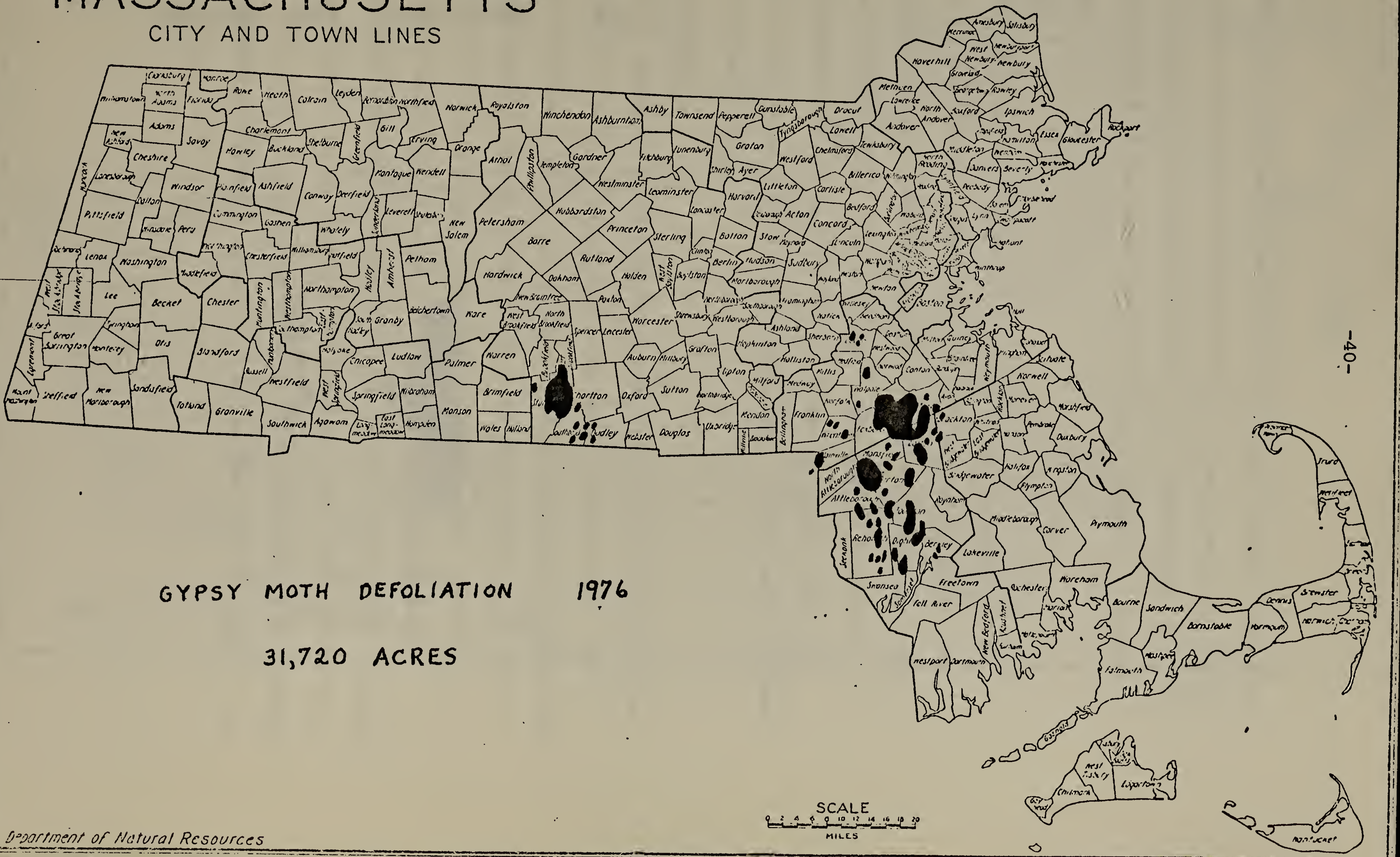
FY 76 again saw this insect in outbreak condition throughout the State. Although its favorite food plant is wild cherry, it could be classed as a general feeder on deciduous trees and shrubs. Aesthetically it creates a problem. The nests are unsightly and cause a great deal of concern. The insect does not, however, permanently damage the trees. The feeding takes place at that time of year when the tree has made most of its growth and has stored most of its food for the following spring. As it has in the past, the population will eventually subside.

Elm Phloem Necrosis

Of particular interest to those of us concerned with the plight of the American Elm and the problem it is facing with the Dutch Elm Disease, is the first confirmation of the presence in Massachusetts of another devastating disease, Elm Phloem Necrosis. Similar in some respects to the Dutch Elm Disease, it tends to clog the vessels of the tree, and the major vector of the disease is an insect. The culprit in this case is a leaf hopper rather than a bark beetle. Leaf hoppers feed by sucking the juices from various plants. In doing so, disease spores are transmitted from diseased to healthy trees.

MASSACHUSETTS

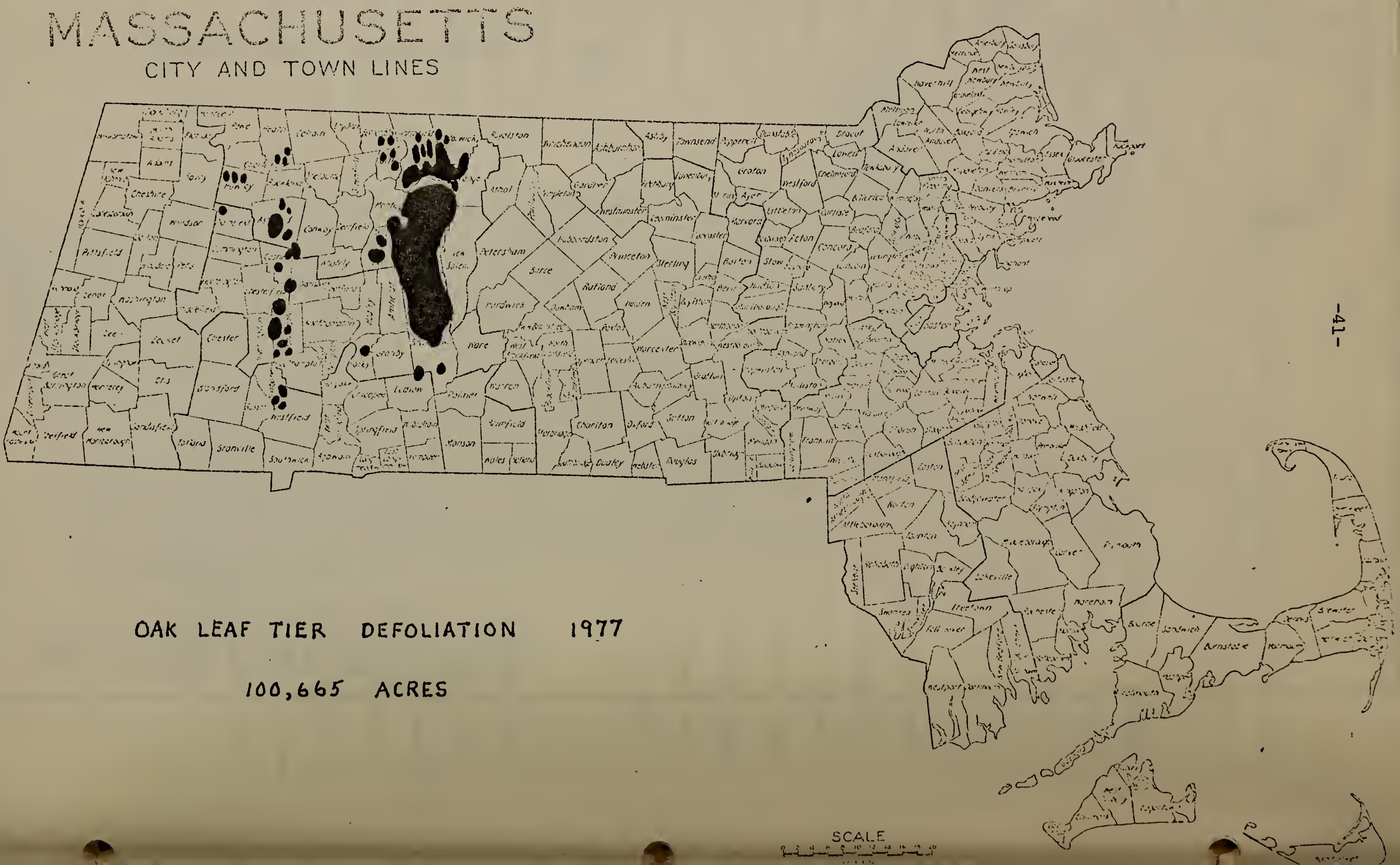
CITY AND TOWN LINES



GYPSY MOTH DEFOLIATION 1976

31,720 ACRES

Department of Natural Resources



MASSACHUSETTS

CITY AND TOWN LINES

OAK LEAF TIER DEFOLIATION 1977

100,665 ACRES

This first confirmation was made by Dr. Francis Holmes, Director of the Shade Tree Laboratories at the University of Massachusetts in Amherst. The suspected tree was discovered in Lincoln. Dr. Holmes smpled the tree, cultured the sample in the laboratory and examined it under an electron microscope.

Storm Damage

The past winter and spring were particularly hard on trees, due to severe ice and wind storms. Many branches, and even whole trees, were felled by these storms. Bureau personnel spent many man days assisting in the massive cleanup job. The major storm came late in the spring, when preparations were underway to get the recreation areas ready for the season. The skills of the men, the chain saws, and the heavy equipment were used to good advantage.

Pesticide Disposal

As noted in previous annual reports, the Department collected and stored at Wompatuck State Park, a large quantity of unwanted pesticides. The collection took place between 1970 and 1975, and the pesticides received were in containers ranging from 55 gallon drums to 1/2 pint bottles, and from 50 pound bags to one pound bags. Three and one half bunkers were filled.

In 1975, the Legislature appropriated $125,000.00 to implement the disposal of these pesticides. Shortly thereafter, the Environmental Protection Agency granted $10,000.00 to assist in the disposal. With the money in hand, a plan was formulated to complete the project. With assistance from personnel in the Environmental Protection Agency, the decision was made to complete the job in two phases.

As it was not known exactly what pesticides would be involved, and what the weight and volume might be, the first phase would be the inventorying and repackaging of the materials. Requests for proposals were sent to ten concerns felt having had the expertise to accomplish the work. Chem-Trol Pollution Services from Model City, NY was awarded the contract. Phase I was completed in February, 1976. All of the chemicals were segregated according to the chemical families. All of the pesticide containers had been examined and where necessary were placed in new 55 gallon drums or palleted to prepare them for transporting when a final destination had been determined.

In April of 1976, a request for submission of a proposal for the loading, transporting and final destruction of the pesticides was sent to firms deemed qualified to complete the project. Again the contract was awarded to Chem-Trol Pollution Services of Model City, N. Y.

On August 13, 1976, a certificate of completion was issued to Chem-Trol covering all but the final disposition. Final payment on the contract was delayed until January of 1977, when all of the 260 tons of pesticides had been destroyed and rendered harmless.

The total cost for the inventorying, repackaging, loading, transporting, and final destruction of the unwanted pesticides was $132,006.13, including $122,006.13 as the Commonwealth's share and $10,000.00 granted by the Federal Government.

Related Programs

Mosquito control is conducted annually on the major recreation areas by means of the Bureau mist blowers. To accomplish the most good in a limited amount of time, the periods of the year when mosquito populations are the highest and park attendees are the highest, is when spraying takes place.

The first spray period is just prior to Memorial Day and the second is just prior to the Fourth of July.

A total of 132 man hours were spent spraying for mosquito control.

Poison ivy control is another related problem undertaken by the Bureau in an effort to assist in the maintenance of the recreation areas. A total of 51 man days were devoted to this endeavor.

Aquatic weeds and algae pose another problem in the proper maintenance of recreation areas. A total of 16 man days were spent surveying those bodies of water considered as problem areas. Only two areas were treated during FY 77. A bloom of algae in Watson Pond in Taunton made it necessary to apply copper sulphate on an emergency basis, to allow the continued use of this swimming area. An over abundance of the aquatic weed, milfoil, was creating a problem at the sailboat launching area at Regatta Point on Lake Quinsigamond. This was treated and the problem overcome.

One of the major problems on the Boston Harbor Islands is the presence of the Norway rat. Without the influence of humans, these rodents are able to survive on shell fish, dead fish which float up onto the shore. When humans are present in any great numbers, their resultant garbage and refuse allows the rats to increase their populations, therefore compounding the problem. During the past fiscal year, two of the most rat-populated islands, Grape and Slate, were treated. Excellent control was attained but not complete elimination. Complete erradication of the species from the islands would be desirable, but it would be unrealistic to believe it possible. As long as the public is invited to use the islands, rats will continue to flourish there.

SUMMATION

Fiscal year 1977 saw a significant increase in two major forest insect problems - the gypsy moth and the oak leaf tier. It should also be noted that this year saw the first laboratory confirmation in Massachusetts of the presence of elm phloem necrosis, a disease almost as deadly as the Dutch Elm Disease. The year saw the removal and complete disposal of the 260 tons of unwanted pesticides which had been stored in bunkers at Wompatuck State Park.

The year also saw the continued efforts of the Bureau to slow down the incidence of the Dutch Elm Disease, and to keep the various cities and towns abreast of the gypsy moth situation, by providing technical advice as to the degree and extent of the pest population. Bureau personnel were also available to advise and recommend concerning the various insect and disease problems facing the various communities - a major Bureau responsibility.

ANNUAL REPORT

FISCAL YEAR 1977

BUREAU OF FIRE CONTROL

SIDNEY THOMPSON JR., CHIEF

General:

The occurrence of forest fires during the normal part of the fall forest fire season was normal with a total of 547 fires reported for the month of October. Records for the month of November show that a total of 611 forest fires was reported. This was unusual for this time of the year.

The spring fire season opened a week or more earlier than normal on a statewide basis and continued on through to mid May without much let up. Spring rains did tend to reduce the hazard slightly at times and did prevent hazardous conditions from developing.

A total of 9,942 forest fires have been reported. These fires burned a total of 10,982.25 acres with an average of 1.10 acres per fire. This results in a total of 133 forest fires more than the last fiscal year.

Prevention:

Records show that there has been a slight decrease in the fire prevention program this year. This is due to increased gasoline use on fire suppression that in turn resulted in severe gasoline restrictions having to be imposed to reduce gasoline consumption during the non fire seasons.

Smokey Bear made a total of 470 appearances. Fire prevention films were shown for a total of 294 times. A total of 352 lectures on fire prevention were given at schools and civic organizations.

Smokey and our fire apparatus participated in a total of 138 parades or fairs where Smokey is usually the star.

Figures from the District Fire Wardens reports indicate that approximately 870,696 persons were exposed to forest fire prevention, in one form or another, during the year. Our second annual Forest Fire Prevention Week was observed the first full week in March and in spite of sufficient advance notice several districts either did not attempt to arrange programs in the schools or were unable to arrange a satisfactory schedule. More progress will be expected from them during our next Forest Fire Prevention Week.

A total of 75 violation slips were issued with a total of 17 acres being brought to court. This resulted in guilty findings in all cases with fines being paid in most cases. While this is an increase of approximately 20 violations over the previous year, most of the violations are coming from four or five districts. This would indicate that more violations should be reported. Now that the forest cutting practice act has been started again, the district fire wardens will be receiving cutting notices and will be expected to enforce the slash laws.

Pre Suppression:

A total of 34 miles of tower roads were maintained by gravelling or grading.

182 miles of state forest roads were graded and gravelled in spots.

The brush was cut on 60.5 miles of tower roads, power and telephone lines.

The brush was cut on 165.5 miles of state forest roads.

Fire tower and maintenance work involved the following:

Replacement of stair treads and platforms where needed. Plexiglas was purchased to replace the glass in windows that were broken by vandals. Windows were repaired at 15 fire towers. Eight towers were painted in the interior and two were painted on the exterior. Fences were repaired at nine tower locations and roofs repaired at four tower locations.

The district fire wardens office at Myles Standish was moved to the fire garage where one stall was remodeled. The wiring was installed by men from district one. The district fire wardens office at Freetown was remodeled.

Brush resulting from the cut - a - cord program was piled and burned at the Freetown Forest. Severe winter storms caused extensive damage in some state forests that resulted in extensive clearance work by the fire crews. Five of the central and western fire districts have completed their new wall maps for the district offices that are to be used in conjunction with the aerial detection system that is presently in use in those districts.

For the most part, most districts perform most of their own maintenance work, this includes repairs to the fire pumps, fire trucks and other fire equipment. Excess property that has been received under the excess property program has been repaired, painted, and placed in service. Some districts have received lubrication units from the excess property program and are now doing their own maintenance work.

A total of eight vehicles were repainted by fire control personnel.

Training:

Again, due to the shortage of personnel, we had to call on recreation personnel for assistance to fill in as reliefs to man the towers and for working on the fire trucks. These men, as well as our regular men received training as observers, truck operators, and pump operators. The cooperation has been excellent. Refresher training courses have been conducted throughout the year.

Two district fire wardens conducted a fire training course at the Junior Conservation Camp in Spencer. This included the use of water to control and mop up a forest fire and the construction of a fire line using hand tools to control a forest fire.

Three district fire wardens attended the annual training session conducted by the Northeastern Forest Fire Protection Commission at Portsmouth, N. H. The subject taught was "Safety."

New Equipment

Through the Governor's Equipment Reserve Fund, we requested and received the sum of $12,108.00 that was used to purchase some much needed 1 1/2" hose, 1 1/8" hose and some pump cans. No other new equipment was authorized.

Suppression

Aid was furnished at the cities and towns by dispatching department owned apparatus to assist them in controlling and extinguishing forest fires. A total of 479 truck runs were made.

Title IV Program

Early in the year the U. S. Forest Service announced that $27,900.00 had been allocated to Massachusetts under the Rural Fire Development Act of 1972. Under this program, RDA funds will pay up to 50% of the cost, with towns under 10,000 population paying the remaining portion for equipment for fire department use. The departments to be selected for reimbursement are rated and those with the highest number are selected. The higher the number, the more needy a town is. This past year, we received 60 applications and processed 51 for payment.

Aerial Detection System:

The aerial detection system was used extensively in the six central and western districts. The Pioneer Aviation Company of Turner Falls was the low bidder on the three flight patterns. The pilots did a good job this year and the system seemed to have improved over other years when three different aviation companies had the contracts.

Total cost for the aerial detection system for fiscal 1977 is as follows:

Flight Pattern	No. Flight Hours	Cost
3	186.5	$4,755.75
4	194.2	4,952.10
5	88.7	2,261.85
Totals	469.4	$11,969.70

Helicopter Water Dropping:

An agreement was again signed with Boston Air Taxi to furnish a helicopter for standby duty, carrying passengers or for transporting a water bucket and dropping water on forest fires. The prices per hour for services are as follows:

Standby duty	$40.00 per hour
Transporting Passengers	$85.00 per hour
Water dropping	$100.00 per hour

The hours of standby duty were from 1300 hours to 1700 hours daily. The helicopter was used 13 times for dropping water on forest fires. The locations are as follows:

April 9, 1977	Otis Air Force Base
April 14, 1977	Blue Hills
April 15, 1977	Warren
April 16, 1977	Blackstone
April 17, 1977	Holyoke
April 18, 1977	North Adams (no service)

April 19, 1977	Sharon
April 21, 1977	Grafton
April 21, 1977	Milford
April 22, 1977	Myles Standish
May 1, 1977	Plymouth
May 2, 1977	Sharon
May 25, 1977	Rowe

Total costs for standby time, transporting passengers and water dropping was $10,460.00.

FOREST FIRE OCCURRENCE

NUMBER AND CLASS

JULY 1, 1976 - JUNE 30, 1977

District	A	B	C	D	E	Total
1	436	59	5	_	_	500
2	579	309	9	2	_	899
3	470	366	24	_	1	861
4	403	255	10	_	_	668
5	780	91	15	2	_	888
6	1,659	617	10	_	_	2,286
7	320	353	25	2	_	700
8	566	267	6	_	_	839
9	177	80	4	1	_	262
10	157	157	7	_	_	321
11	528	167	8	_	_	703
12	39	174	8	_	_	221
14	368	403	23	_	_	794
Totals	6,482	3,298	154	7	1	9,942

Class A - Fire is .25 acres or less.

Class B - Fire is .26 to 9.9 acres.

Class C - Fire is 10 to 99 acres.

Class D - Fire is 100 to 299 acres.

Class E - Fire is 300 to 999 acres.

Class F - Fire is 1,000 to 4,999 acres.

Class G - Fire is 5,000 acres or over.

ACREAGE BY DISTRICTS

JULY 1, 1976 - JUNE 30, 1977

District	A	B	C	D	E	Total
1	45.85	108.50	81.50	-	-	235.85
2	126.35	396.50	220.00	310.00	-	1,052.85
3	115.55	591.75	634.00	-	350.00	1,691.30
4	97.75	406.50	338.00	-	-	842.25
5	195.00	184.75	380.00	300.00	-	1,059.75
6	270.65	747.75	181.00	-	-	1,199.40
7	80.00	558.00	480.00	205.00	-	1,323.00
8	141.20	438.00	92.00	-	-	671.20
9	24.60	114.50	124.00	144.00	-	407.10
10	38.75	190.95	94.00	-	-	323.70
11	52.80	262.00	225.00	-	-	539.80
12	9.75	266.50	237.00	-	-	513.25
14	92.00	572.80	458.00	-	-	1,122.80
Totals	1,290.25	4,838.50	3,544.50	959.00	350.00	10,982.25

ACREAGE BY CAUSES

JULY 1, 1976 - JUNE 30, 1977

Camper	Smoker	Debris	Incend.	Lightning	Misc.	Children	R.R.	Equip. Use	Total
168.70	268.15	431.85	4,013.55	1.65	1,647	3,790.40	572.70	88.20	10,982.25

NO. OF FIRES BY RESPONSIBILITY

JULY 1, 1976 - JUNE 30, 1977

Timber Opr.	Recreation	Other	R.R.	Landowner or Occupant
3	44	---	318	594

DAMAGE BY TYPE

JULY 1, 1976 - JUNE 30, 1977

imber roducts	Watershed	Recreation	Wildlife	Real Property	Personal Property	Total
760.00	-----	$180.00	$30,056.45	$300.00	------	$31,296.45

NO. OF FIRES (TYPE OF AREA)

JULY 1, 1976 - JUNE 30, 1977

Com. Forest	Non-Com. Forest	Non-Forested Watershed	Non-Forest	Total
2,087	6,246	56	1,553	9,942

ACREAGE BURNED (TYPE OF AREA)

JULY 1, 1976 TO JUNE 30, 1977

District	1	2	3	4	5	6	7	8	9	10	11	12	14	Total
Com. Forest	.30	916.85	45.25	548.50	212.50	44.20	1241.50	45.50	311.60	---	257.40	---	202.25	$ 3,825.85
Non-Com. Forest	221.65	135.80	1272.45	231.85	212.00	1103.25	----	613.70	95.50	292.20	196.40	513.25	920.55	5,808.60
Non Forested	12.10	---	338.35	61.40	567.50	50.80	81.50	----	----	31.50	86.00	----	----	1,229.15
Non Forested Watershed	1.80	.20	35.25	.50	67.75	1.15	----	12.00	----	----	----	----	----	118.65
TOTALS	235.85	1052.85	1691.30	842.25	1059.75	1199.40	1323.00	671.20	407.10	323.70	539.80	513.25	1122.80	$ 10,982.25

SUMMARY BY CAUSES

JULY 1, 1976 TO JUNE 30, 1977

ISTRICT	LIGHTNING	CAMPER	SMOKER	DEBRIS	INCEND.	EQUIP. USE	R. R.	CHILDREN	MISC.	TOTAL
1	--	32	49	22	54	14	1	150	178	500
2	--	25	49	69	167	5	--	453	131	899
3	--	5	14	39	140	6	27	406	224	861
4	--	3	13	5	321	1	2	322	1	668
5	--	--	--	--	165	1	--	722	--	888
6	1	24	71	90	36	13	44	605	1,402	2,286
7	--	5	3	51	535	4	5	95	2	700
8	--	22	36	106	99	5	40	519	12	839
9	1	8	23	54	31	9	99	36	1	262
	1	7	19	44	63	-	13	110	64	321
1	--	6	25	59	26	8	65	84	430	703
2	--	2	1	30	4	6	15	121	42	221
4	2	6	21	87	96	6	7	518	111	794
TAL	5	145	324	596	1,737	78	318	4,141	2,598	9,942

SUMMARY BY DISTRICTS

JULY 1, 1976 TO JUNE 30, 1977

District	No. Fires	Acres	Cost
1	500	235.85	$42,941.41
2	899	1,052.85	27,204.75
3	861	1,691.30	29,296.50
4	668	842.25	38,490.40
5	888	1,059.75	17,348.05
6	2,286	1,199.40	37,623.25
7	700	1,323.00	37,574.00
8	839	671.20	35,639.15
9	262	407.10	37,583.79
10	321	323.70	9,030.50
11	703	539.80	---
12	221	513.25	39,816.00
14	794	1,122.80	40,213.00
	9,942	10,982.25	$392,760.80

SUMMARY BY MONTHS

JULY 1, 1976 TO JUNE 30, 1977

Month	No. Fires	Acres	Cost
July	665	370.75	$20,870.50
August	178	94.65	4,867.06
September	142	46.35	3,464.87
October	547	381.00	11,370.74
November	611	520.65	22,062.87
December	0	0	0
January	18	3.30	411.50
February	399	441.60	15,696.06
March	1,489	1,350.90	49,114.23
April	4,039	5,806.75	199,667.87
May	990	1,422.75	40,405.74
June	864	543.55	24,829.36
	9,942	10,982.25	$392,760.80

General Recommendations:

The policy of hiring employees on an intermittent basis, rather than on a seasonal basis, has led to lowering the morale of employees that had been employed on a seasonal basis for many years; they were members of the retirement system and were also entitled to other privileges that were allowed state employees.

It is strongly recommended that we attempt to return to the seasonal system of hiring.

ANNUAL REPORT

FISCAL YEAR 1977

BUREAU OF RECREATION

CHARLES H. DANE, CHIEF

Fiscal Year 1977 was an eventful year for the Bureau of Recreation, even though the economic situation was not good and the weather was less than cooperative on week-ends during the summer of 1976. This coupled with increased parking rates resulted in 400,000 less visitors in FY 77 than in FY 76, and a decrease in income of $38,000.00. It is anticipated that this was a one-year decline and we will quickly revert to our normal yearly increases.

Rules and regulations were updated for the first time in two years, an expiremental beach grass nursery was established, hang gliders proliferated on state lands, and the skating rinks became the scene of field hockey games, antique auto shows, and rock concerts, as our efforts to more fully utilize our facilities began to bear fruit.

Particular items of interest for FY 77 are as follows:

Summer Jobs Filled By Lottery

On April 13, 1977, Governor Dukakis announced that all summer positions would be filled by a lottery system based on birthdates.

The Governor described the new program in this manner. "This year we will have a state summer jobs program which will eliminate, once and for all, any hint of political favoritism. No one will be hired unless he or she has been referred by the Department of Employment Security and chosen on the basis of an impartial lottery."

The birthdate drawing was held in the Governor's office on April 25, 1977. The birthdates, as drawn, were used during this past recreation season to fill some 2400 seasonal slots at beaches, pools and parks operated by M.D.C. and D.E.M.

While the new system proved to be impartial, a great many problems developed with filling positions in a timely manner. Perhaps, further refinement of the system will serve to reduce the problems experienced this past fiscal year.

Dignitaries Visit

Several well-known celebrities visited our facilities during the past fiscal year. Quinsigamond State Park played host to the nationally known athlete and winner of seven Olympic gold medals, Mark Spitz. Mr. Spitz toured the area to observe some of the local swimming clubs during their training sessions.

Equally well-known in his field, noted conservationist, lecturer and oceanographer, Jacques Cousteau, toured the Boston Harbor Islands State Park system to celebrate "Earth Day." The tour was followed by lectures, films and displays underscoring the pressing need for conservation of our natural resources through more efficient utilization and recycling.

Recreation Accounting System

In January of this year, an accounting system was put into practice which, hopefully, will enable us to determine what the costs by subsidiary of running a particular recreation area are. Upon evaluating its first six months of operation, we find that it is working. There are a few "bugs" left to be ironed out, but it can be termed a successful, working system. Copies of this quarterly accounting are to be used as back-up material during this year's budget hearings.

Vandalism

The scourge of public recreation, vandalism again took its toll on our facilities in Fiscal 77. Most damage done by vandals this past year was of a relatively minor nature,however, when all damage done is tallied for the entire Forest and Park system, the cost of vandalism each year can be staggering.

Some estimates have been as much as 10% or more of our total maintenance budget is expended each year to correct damage caused directly or indirectly by vandalism.

Several major acts of vandalism however were experienced in Region II. At Harold Parker State Forest, an entire comfort station was destroyed by fire set by an arsonist. Damage was estimated at $32,000.00. In another incident, a comfort station at Hopkinton State Park was vandalised during the winter months with a shotgun. Damage was estimated at nearly $4,000.00. At Lowell Dracut State Forest, the office was broken into and a new Rack Truck stolen. The truck was driven into the woods and burned. The truck and a load of lumber were destroyed. Damages are in excess of $4,000.00.

Investigations into these incidents are continuing, however in at least one case (burning of Harold Parker Comfort Station) the vandal has been apprehended and restitution ordered.

Region V also suffered vandalism damage in excess of $3,000.00 during a break-in at Bascom Lodge on Mt. Greylock. Most damage done was to furniture stored in the lodge.

In order to reduce vandalism, alarm systems have been installed at Dighton Rock Museum, Mt. Greylock Visitors' Center, and our headquarters buildings in Clinton and Carlisle.

Beach Grass Propagation Program

Fiscal 1977 saw a major breakthrough in the proverbial problem of erosion control on Department salt water beaches and dunes.

It has long been known that the planting of beach grass in beach and dune areas prone to wind and water erosion has had the effect of greatly decreasing the effects of nature's fury in our coastal areas. Unfortunately, acquiring an adequate supply of healthy beach grass stock has historically been most difficult.

Through the cooperation of the U. S. Soil Conservation Service, who supplied the planting stock, the Massachusetts Office of Coastal Zone Management, who coordinated the effort, and this Agency, who converted a sanitary landfill dump at Myles Standish State Forest into a beach grass nursery, the problem of supply for future needs appears to have been solved.

Some 9000 beach grass shoots were planted in the one acre landfill site. An irrigation system comprised of hundreds of feet of fire hose connected to a powerful fire pump served to provide the necessary moisture to get the shoots going.

At last report, some one and one third million healthy shoots of hybrid beach grass stands ready for harvesting to be used as needed in the constant battle against dune and beach erosion.

North American Family Camping Association

The above-named group was founded at Otter River State Forest in the spring of 1957. This year, in honor of their twentieth anniversary, they returned to Otter River for the week-end of April 22, 23, 24. Approximately 100 families attended. The group dedicated a plaque which was erected near the bulletin board. This plaque, along with two flag poles and 35 park benches, were donated to the State by the Association. It is hoped that this relationship will continue and spread to other state camping areas.

BOSTON HARBOR ISLANDS

Acquisition and Construction

During FY 77, continued implementation of the Boston Harbor Islands Comprehensive Plan involved the construction of piers at Grape and Bumpkin Islands, further development of the island trail systems, camping sites and picknicking areas, the placement of interpretive signs, and landscape restoration work, including a tree planting program. A pier is currently under construction at Great Brewster Island.

During the latter part of FY 77, the Department acquired from the federal government a 15.5 acre parcel of land located on the shores of the Weymouth Back River. The site, which was formerly the location of NIKE Missile Battery 36, is linked visually and historically to the Boston Harbor Islands and will be developed as the Captain William K. Webb Memorial Park in honor of a former Weymouth police captain. Development of the site will include picnic sites, bicycle paths, an observation tower dedicated to the memory of John H. Cole, a lifelong resident of Weymouth and a former town meeting member, and opportunities for nature study. The site presently serves as a base of operations for the maintenance of the Boston Harbor Islands State Park system.

Transportation

Convenient public access to the islands has long been recognized as a key factor in the successful operation of the Boston Harbor Islands State Park. During FY 77, the Department assured provision of the service by entering into contracts with two boatline operators, Richard Nakashian of the Bay State Spray and Provincetown Steamship Company, and Dana Goodell of Bay Fishing, Inc.

Under the terms of Mr. Nakashian's contract, three round trips from the

Boston mainland to Georges Island were provided during weekdays in July and August. Mr. Nakashian reported that the combined total of visitors on weekdays and weekends during the summer period was over 30,000 persons, a substantial increase over that of previous years.

The contract with Mr. Goodell provided for passage of visitors from Georges Island to Gallops, Lovells, Grape and Bumpkin Islands during weekends in June and September and on a daily basis in July and August via a 49-passenger water taxi. During FY 77, the second year of operation of the service, a total of 12,586 water taxi trips was recorded.

SPECIAL PROGRAMS

Audubon Intern Program

The Audubon Intern Program, which was developed in cooperation with the Massachusetts Audubon Society, was initiated during FY 77. The program involved ten college and graduate school students with a particular interest in the Harbor Islands. The interns lived on five of the islands and acted as island managers and interpretive guides. As a part of their assignment, the interns prepared research reports on different aspects of the natural environment. The reports also contained helpful data on visitor use.

Transportation Program

In addition to the contracts to provide regularly scheduled daily service to the islands, the Department initiated two special transportation programs during FY 77: The Group Use program and the Reduced Fare program.

The Group Use program, which was in effect Monday through Friday during the period July 16 - September 3, 1976, provided free transportation to the islands for members of non-profit community groups and service agencies.

A total of 5,349 persons who were members of 65 different organizations participated in the program. Participation data are summarized below:

	Groups	Visits	Children	Adults
Youth Groups	43	77	2874	1150
Multi-Age Groups	6	12	407	188
Senior Citizen Groups	7	7	---	245
Handicapped Groups	9	16	209	276
TOTAL	65	112	3490	1859

The Reduced Fare program provided for a reduction in the normal transportation fee of $3/adult and $2/child to $2/adult and $1/child. A total of 3,200 persons took advantage of the program which was in effect Monday, Tuesday and Wednesday during the period July 26 - September 1, 1976.

APPALACHIAN TRAIL

Almer Huntley, Jr., Associates Inc., has been hired by the U. S. Park Service to land survey work on all landowners excepting state forest property. It is to be completed on or before October 17, 1977.

Huntley Associates has two survey parties in the field at the present time. One crew working from the Mount Everett State Reservation south to the Connecticut state line. The second crew has completed a center line traverse from the Clarksburg State Forest to the Mount Greylock State Reservation. This crew will now work from the south side of Cheshire center, south to the Crane Company property in Dalton.

Certified letters from Commissioner Kendall were mailed to 44 landowners. This letter requested that surveyors be allowed to enter properties for the purpose of survey work only. A permission form (to be signed by landowners) was enclosed with the letter. These forms were to be returned to the Regional Supervisor, Region #5. To date, 25 landowners have given written permission to enter upon their property. Two (2) landowners have refused the right-of-entry. One by certified mail and one verbally.

A new relocation has been flagged in Cheshire from the Mt. Greylock State Reservation south to West Mtn. Road in Cheshire. This is a solution to avoid the Town of Cheshire watershed property. There are three landowners involved in this relocation. One of these owners is completely opposed to the A.T. being located on his property. He has stated his opposition verbally, so it is possible that this property will have to be taken by eminent domain.

The trail will parallel a Massachusetts Electric Co. powerline immediately north of West Mountain Road, and will tie in with the 361 acre parcel which W. J. Cowee Co., Inc. has offered to sell to the Commonwealth.

A new relocation is being worked on south of Jerusalem Road and east of Brace Road in Tyringham. More in the continuing saga of the Appalachian Trail in next year's annual report.

SKINNER STATE PARK

Skinner State Park in South Hadley has been the site of much activity this year. The DEM contracted with the Society for the Preservation of New England Antiquities to make a historic and economic assessment of the "summit house" and the park.

The Department felt that this historic site warranted the expenditure of funds for such a study. Armed with this document, input from public hearings, and an advisory council formed explicitly for this area, the DEM plans to refurbish the summit house with particular emphasis on its historical aspects; repair the "halfway house"; improve the trail system; erect a shelter for the steam engine that once powered a tramway to the summit; and in general, refurbish the area so that it reflects its history.

LOWELL HERITAGE STATE PARK

After being rained out for two weekends in a row, the formal dedication ceremonies for Lowell Heritage State Park were finally held on Sunday, August 16, 1976.

On Sunday night, the rains held off long enough for the dedication ceremonies with speeches by Dr. Bette Woddy, then Commissioner of Environmental Management, and local, state and federal officials. Speeches were followed by skits performed by the "Bread and Puppet Theatre" of Vermont.

The dedication was held at the new performance center located on Pautucket Boulevard near the shores of the Merrimack River in Lowell. Full scale operation of the completed Lowell Heritage State Park system is planned for early spring of 1979.

Being located in an urban area, and oriented to the Lowell canal system and the Merrimack and Concord Rivers, this developing park will have a substantially different physical configuration from that of a traditional state park. Unlike most parks, the Heritage Park will not involve the aggregation of a large unit of land; it will be a dispersed park system, with sites and facilities interspersed throughout the urban area in a system of individual "nodes." These sites will be connected by land and water circulation systems, with the canals and rivers serving as the unifying feature tying together the several scattered land parcels.

Present and future development of the Heritage Park system is designed to provide the user with an experience that exposes him to a variety of urban environments. The user will be aware of his location within the park system, but will not be bound to that system.

The Heritage Park user will travel through the park on foot, bicycle, boat or mass transit. Use of these modes of travel will help to insure a pleasurable urban experience while avoiding the adverse impacts that large numbers of automobiles would have on pedestrian safety, air quality, traffic circulation and noise levels.

A lecture followed by a bus and boat tour of this unique urban park was held during June. All the participants, which included Lt. Governor O'Neil and Secretary Murphy, were provided an impressive view of this vital park and the city which holds it.

Additional acquisition, demolition of undesirable structures and refurbishing of historic ones is continuing and will result in a truly unique addition to our Forest and Park system.

DIGHTON ROCK MUSEUM

Dedication ceremonies were held May 14th for the new Dighton Rock Museum. The structure, an octagonal building built adjacent to the Dighton Rock itself, will serve as an interpretive center for this unique facility.

Dighton Rock itself is a forty-ton boulder which used to lie in the Taunton River at Berkley, Massachusetts. Early settlers found a bewildering array of lines and curves carved in the stone. These markings (or petroglyphs) date at least from the 17th century and are probably still older. In 1963, the rock was raised out of the water and placed on an embankment where it has remained. In 1973, an octagonal shaped building was erected to house it (not to be confused with the museum building.)

More than twenty theories, none of them indisputable, have been proposed as to the origin of the Dighton Rock carvings.

The four most popular theories as to who incised the markings on the rock - Native American, Phoenician (Lebanese), Norse and Portuguese - are interpreted in the new museum. The ethnic communities corresponding to each of the four theories represented, participated in the dedication with ethnic food, music, dance and costume.

INTERPRETIVE SERVICES

During the summer of 1976, Forests & Parks entered into a contract with the Massachusetts Audubon Society to create an internship program for the Boston Harbor Island State Parks. The interns were responsible for greeting park visitors, leading walks, doing research and overseeing their prospective islands. William Guissentanner was hired to conduct an orientation program and supervise the interns during the summer.

Visitor response to the program was enthusiastic and the interns generally agreed that the program was successful. A second contract was issued to Mass. Audubon for FY 78 as a result.

In February, Forests & Parks, in cooperation with the Appalachian Mountain Club, decided to design a pilot project to place 8 volunteer naturalists in 4 State parks during summer, 1977. The program was based on programs run by the AMC, the National Park Service, and the Student Conservation Association. The purpose is to provide guided walks, talks and evening programs for the visiting public. Volunteer naturalists wer recruited, the advertisements placed in AMC Chapter publications.

By June 30, 1977, 8 volunteers were selected from a field of 42 applicants, ranging in ages from 15 to 16. A two-day training session was conducted for the naturalists, including park supervisors on the second day. At that time, goals were established for each park.

In other areas, the Dighton Rock Museum opened, and the Borderland State Park brochure was published.

RINKS & POOLS PROGRAM

The skating rink program appears to be at a stay where construction will not continue to increase the number of facilities. However, the demand for ice time likely will increase due to the closing of a number of private rinks. Public skating attendance is down from previous years, mainly due to the lesser number of children being born. This trend is also reflected in the school system. Should the pattern continue, the public rinks may be the only indoor ice skating arenas available.

The off-season usage of the rinks is expected to increase, as more and more people become aware of their availability. Several groups which utilized the rinks this past year are already planning to repeat in the future. The street hockey program appears to have a good future and other activities will be added.

The swimming pools have grown in number to 19. "Learn to Swim" programs are a valuable contribution to the communities involving both children and adults.

The Rink and Pool program is continuing its emphasis on energy conservation, and is adding water conservation to the list. Heat recovery from the refrigeration units, aluminum ceilings and higher efficiency lighting will be installed in the near future at the rinks.

RINKS		POOLS	
ATTENDANCE	2,118,244	ATTENDANCE	388,670
INCOME	$1,448,846	INCOME	$49,270

While construction trickled to a stop with the opening of the Clinton pool last August, the Rink and Pool program had many significant developments occur during fiscal 1977.

In the area of energy conservation, there were several important items either installed or authorized: capacitors have been placed in most rinks and will soon be in all; a "Watt Watcher" load management control is now in operation at Fall River; new heating systems for the additions at Brockton, Worcester and Springfield are operational; air ducts for the large Johnson heaters were altered to create a circular flow outside the dashers at Fall River; the Zamboni machine at Taunton was converted to propane gas for fuel. Finally, a very important step, a program for all rinks involving heat recovery systems utilizing the B.T.U.'s being dissipated by the condensors or cooling towers. A lesser part of this same package will put aluminized ceilings at Brockton, Worcester and Springfield, plus provision for experimental lighting.

Street hockey floors were purchased and installed at Gardner and Fall River. Considering the newness of the program, both rinks are doing well.

Off season rentals of the rinks are increasing gradually. More effort on the part of the superintendent is needed before we can reach a satisfactory level of usage.

Dasherboards are being replaced at Greenfield and North Adams. The latter facility will have a summer figure-skating school, the first in several years.

Fiscal 77 saw the enactment of legislation freezing the rates at the rinks at the January 1, 1976 level, and requiring swimming pools to be drained or covered after closing.

Contracts for new roofs were awarded for Brockton and Worcester rinks.

New equipment purchased: 1 rink truck with plow for Worcester;
4 pool pickups.

Brockton and Worcester had 3 compressors rebuilt.

The R&P District Supervisors, Roderick, Butler and Dion, received new sedans with 2-way radios for the first time.

Hockey Tournament was held at Auburn Rink. The swim meet took place at Bennett Field pool in Worcester.

Our first figure skating competition was held in Region 1, and is expected to expand next year.

The New Bedford rink was rededicated to a young hockey player, Stephen Hetland. Governor Dukakis attended the ceremony.

The Clinton pool was the recipient of our first Hydroanalyzer, which automatically monitors the water and compensates by adding or reducing the needed chemicals.

Six of the original seven pools had their filters replaced.

Outstanding off season programs were: Market Place '77 - Brockton; Home and Trade Show - North Adams; "Cabaret" - Marlboro; and the Antique Car Show and Auction - Worcester.

The Marine and Recreation Vehicle Division is utilizing space in Lowell and Fall River rinks.

For the first time, R & P personnel were deeply involved in the SCORP inventory.

All in all, a fairly impressive list of pluses with very few minuses.

S.C.O.R.P.

A major effort by Forests and Parks regional staff was in great degree responsible for the June 1977 completion of the Statewide Comprehensive Outdoor Recreation Plan Inventory (SCORP).

Under the direction of Robert Yaro, Chief of the Department's Planning section, a complete inventory of all public recreation facilities throughout the Commonwealth was made with the resultant data to be sued to produce the final Recreation Plan for Massachusetts for submission to the Bureau of Outdoor Recreation (BOR).

Such a plan is necessary in order to qualify for federal funding from BOR for recreation projects. The SCORP report is presently being compiled and will be submitted to BOR for approval in the near future.

Over 100 Forests and Parks field employees took part in the tedious work of identifying and cataloging all public recreation sites in their respective regions. The project began in early spring and was completed by June of 1977.

RULES AND REGULATIONS HEARINGS HELD

The Division held public hearings on Monday, February 28, 1977, for the purpose of reviewing revisions and additions to the rules and regulations governing property under its control. The hearings took place at the following locations:

Community	Location	Time
Boston	Leverett Saltonstall Building Room 2106 100 Cambridge Street Boston, Massachusetts 02202	2:00 p.m.
Taunton	Taunton Skating Rink William Street Taunton, Massachusetts 02700	7:30 p.m.
Haverhill	Veterans Memorial Skating Rink Brook Street Haverhill, Massachusetts 01830	7:30 p.m.
Clinton	Dept. of Environmental Management Regional Headquarters Route 110 Clinton, Massachusetts 01237	7:30 p.m.
Pittsfield	Mt. Greylock State Reservation Visitors Center Lanesboro, Massachusetts 01237	7:30 p.m.
Holyoke	Henry J. Fitzpatrick Skating Rink Maple Street Holyoke, Massachusetts 01040	7:30 p.m.

Statutory authority for the regulation of these areas is in accordance with Chapter 21 of the General Laws and Section II, Chapter 577, of the Acts of 1947.

The hearings involved discussion on the following matters:

A. Camping and Day Use Regulations.

B. Rules and Regulations relative to hunting, trapping and the discharge of firearms.

C. Recreational trail facilities.

D. Swimming Pools.

E. Skating Arenas.

F. Special Regulations pertaining to certain areas.

The public was urged to attend and express opinions relative to the regulative proposals. Written responses also received thorough considerations.

After in-depth review of public responses, accepted additions and alterations were made. The Division's new rules and regulations, as accepted by the Attorney General's Office, were then printed and are presently in force statewide.

ACQUISITION AND CONSTRUCTION

The following sheets shows the busy year experienced by our Acquisition and Construction Program.

LAND ACQUISITION & CONSTRUCTION - FISCAL YEAR - 1977

MISCELLANEOUS CONTRACTS

TITLE OF EACH CATEGORY	NUMBER OF CONTRACTS OF EACH CATEGORY	TOTAL DOLLAR VALUE OF EACH CATEGORY	
Construction	23	645,395.50	
Appraisers	28	65,635.00	
Title Exam	17	68,440.00	
Survey	7	35,221.00	
Resident Engineer	5	41,500.00	
Designer	1	36,000.00	
Totals	81	892,191.50	
			$ 892,191.50

LAND ACQUISITION

NUMBER OF PARCELS	AMOUNT OF ACREAGE	TOTAL COST OF PARCELS	
23	415.75	1,046,800.00	
			1,046,800.00

CONSTRUCTION AND SITE IMPROVEMENT MATERIALS

Construction and Site Improvement Materials installed both in construction contracts and by Department personnel at:

Boston Harbor Islands State Park & Lowell Heritage State Park	133,600.00	
DEM purchased materials		133,600.00
	TOTAL DOLLAR VALUE	$2,072,591.50

REGION	FOREST/PARK/ RESERVATION	CONTRACT NUMBER	GENERAL CONTRACTOR	CONTRACT AMOUNT	CONTRACT DATE	SCOPE OF WORK
1	Boston Harbor Islands State Park	836-77	Rand Development Corp. 85 Moore Street Weymouth, Mass. 02188	$8,961.00	8/4/76	Embarkation Area Signs
1	Boston Harbor Islands State Park	854-77	J. M. Cashman, Inc. 800 Bridge Street North Weymouth, Mass. 02191	$94,800.00	6/20/77	Pier - Great Brewster
1	Boston Harbor Islands State Park	857-77	J. M. Cashman, Inc. 800 Bridge Street North Weymouth, Mass. 02191	$36,160.00	4/25/77	Construction of Float Piles Grape & Bumkin Islands
1	Martha's Vineyard State Forest	855-77	Campanella Corp. 780 Jefferson Blvd. Warwick, R.I. 02877	$50,000.00	5/3/77	Reconstruction of Bicycle Trail
1	Massasoit State Park	842-76	Souza Electric, Inc. 184 School Street Taunton, Mass. 02780	$650.00	8/23/76	Installation of Grounding Grid
1	Oak Bluffs, Mass.	847-76	Keyland Construction Box 1167 Martha's Vineyard Airp Edgartown, Mass.	$ 10,175.00	12/9/76	Renovation of State Lobster Hatchery
1	Scusset State Beach Reservation	865-77	Scott Associates, Inc. 60 Water Street Clinton, Mass. 01510	$13,500.00		Restoration of Water System

REGION	FOREST/PARK/ RESERVATION	CONTRACT NUMBER	GENERAL CONTRACTOR	CONTRACT AMOUNT	DATE	SCOPE OF WORK
2	Bradley-Palmer State Park	851-77	Euclid Constr. Co. 145 Overland Road Waltham, Mass. 02154	$9,340.00	4/6/77	Sewage Disposal System
2	Carlisle State Fores	849-76	R. A. Hammond Cons. Corp. Merriam Road North Oxford, Mass.	$4,600.00	12/1/76	Construction of Sewage Disposal System
2	Harold Parker State Forest Andover, Mass.	801-77	Warren Brothers Co. 509 Main Street Saugus, Mass. 01906	$75,554.00	4/29/77	Road Improvements
2	Lowell Heritage State Park	823-76	H. M. Horton, Co. 28 Gould Street Walpole, Mass. 02081	$4,196.00	9/24/76	Painting - Pawtucket Boulevard Park
2	Lowell Heritage State Park	837-76	Gaudet & Co., Inc. 35 Brookside Street Dracut, Mass. 01826	$64,007.00	9/1/76	Site Developement-Francis Gate Park
2	Lowell Heritage State Park	838-76	John D. Ahern 360 Main Street Melrose, Mass. 02176	$9,594.00	10/15/76	Rehabilatation of Francis Gate Lockhouse-Lowell Heritage State Park
2	Lowell Heritage State Park	846-76	Gaudet & Co., Inc. 35 Brookside Street Dracut, Mass. 01826	$29,454.50	1/6/77	Site Developement Phrase II-Frances Gate Park

REGION	FOREST/PARK/ RESERVATION	CONTRACT NUMBER	GENERAL CONTRACTOR	CONTRACT AMOUNT	EST. COMPL. DATE	SCOPE OF WORK
2	Lowell Heritage State Park	850-76	Jay-Mor Wrecking Co. 128 So. Shore Drive Pelham, N. H. 03076	$96,000.00	3/10/77	Demolition of YMCA Building
2	Lowell Heritage State Park	852-77	Endmoor Development 774 Dutton Street Lowell, Mass.	$24,900.00	2/10/77	Alterations to Boathouse Pawtucket Blvd. Park
2	Salisbury State Beach Reservation	867-77	Scott Associates Inc. 60 Water Street Clinton, Mass. 01510	$1,768.00	6/6/77	Automation of Comfort Station
2	Salisbury State Beach Reservation	874-77	Maurice Concrete Products, Inc. Haverhill Road Amesbury, Mass.	$690.00	5/31/77	Alterations to Manhole
2	Veteran's Memorial Skating Arena Haverhill, Mass.	870-77	Parker Company Railroad Avenue Andover, Mass. 01810	$1,589.00	6/3/77	Repair to Entrance Doors
4	Crooked Pond Plainfield, Mass.	833-76	R. J. Fijol, Inc. High Street West Warren, Mass. 01092	$57,457.00	8/23/76	Reconstruction of Dam
4	Mohawk Trail State Forest Charlemont, Mass.	848-76	Robert C. Durkee & Son 30 Fairfield Avenue Florence, Mass 01060	$7,900.00	11/18/76	Construction of Bridge Abatments

REGION	FOREST/PARK/ RESERVATION	CONTRACT NUMBER	GENERAL CONTRACTOR	CONTRACT AMOUNT	EST. COMPL. DATE	SCOPE OF WORK
5	Mount Greylock	835-76	Boyd Waterproofing Corp. P. O. Box 216 Somerville, Mass.	$1,850.00	7/27/76	Waterproofing of Exterior Walls - Mount Greylock Memorial Tour
4 & 5	Greenfield & North Adams Skating Rinks	869-77	Ace Dasher Boards Inc. 283 Salem Street Woburn, Mass. 01801	$42.250.00	6/15/77	Repair of Dasher Boards

ACQUISITION & CONSTRUCTION

Page 1 of 2

FISCAL YEAR 1977

Land Acquisition - JULY 1, 1976 - JUNE 30, 1977

LOCATION	AREA	GRANTOR	DATE REC.	ACREAGE	COST
Concord	Walden Pond	James G. Sliman (Walden Breezes)	7/1/76	6.75 A	$365,000
Amherst	Holyoke Range	Long Mt. Realty Trust	7/2/76	79.8 A	155,000
Amherst	Holyoke Range	Doris R. Wales	9/16/76	3.5 A	5,250
Amherst	Holyoke Range	Homer W. Cowles	9/16/76	44 A	21,750
Gt. Barrington	Beartown S.F.	Potter - Bassinait	10/18/76	0	0
Ashland	Ashland S.P.	Disposition - D.E.M. to Kadlick	12/76	Easement	0
Lowell	Lowell Heritage	Y.M.C.A. of Greater Lowell	11/17/76	2/3 A	109,000
So. Hadley	Holyoke Range	Phebe & Carlton Nash	12/30/76	10 A	5,000
So. Hadley	Holyoke Range	Carlton S. Nash	12/30/76	17 A	8,500
Halifax	Public Access	Park Realty Trust (Radosta)	12/7/76	4.3 A	65,000
Westfield	Pequot Ponds	Epon Realty Trust (O'Neil)	12/1/76	10.1 A	62,000

ACQUISITION & CONSTRUCTION

Page 2 of 2

FISCAL YEAR 1977

Land Acquistion - JULY 1, 1976 - JUNE 30, 1977

LOCATION	AREA	GRANTOR	DATE REC.	ACREAGE	COST
So. Hadley	Holyoke Range	Arthur & Margaret Morin	2/3/77	18 A	$ 5,400
Amherst	Holyoke Range	Albert & Reta Brace (Conservation Restriction)	2/3/77	14.5 A	750
Amherst	Holyoke Range	Morton & Marilyn Harmatz	2/3/77	17.5 A	14,000
Granby	Holyoke Range	Stephen & David Lamb	2/3/77	22 A	6,000
Agawam	Robinson S.P.	Disposition - Commonwealth to Liquori		1 A	1,250
Amherst	Holyoke Range	W.D. Cowls Inc.	3/11/77	6 A	3,000
Amherst	Holyoke Range	Seymour & Alice Epstein	3/11/77	46.5 A	109,000
So. Hadley	Holyoke Range	Eugene V. Madej and Julia C. Madej	3/30/77	12 A	3,600
So. Hadley	Holyoke Range	George Harlan Nash	4/21/77	7.5 A	3,000
Holyoke	Holyoke Range	Trznadel & Welson	4/21/77	77 A	23,000
Amherst	Holyoke Range	Mildred L. Morton	6/7/77	16 A	11,300
Lowell	Lowell Heritage	Frank & Claire Barrett	6/24/77	70,900 S.F.	70,000

1977 Fiscal Year

Attendance Record

AREA	CAMPING	DAY USE	TOTAL
AMES NOWELL		22,856	22,856
ASHLAND		27,931	27,931
BEARTOWN	7,887	23,144	31,031
BORDERLAND		66,325	66,325
BRADLEY PALMER		42,335	42,335
BUFFUMVILLE		23,510	23,510
CAMPBELL FALLS		3,240	3,240
CHESTER		9,481	9,481
CHICOPEE		102,565	102,565
CLARKSBURG	6,285	24,250	30,535
COCHITUATE		258,154	258,154
COOKSON		3,095	3,095
D.A.R.	16,371	29,928	46,299
DEAN POND, BRIMFIELD		15,024	15,024
DEMAREST LLOYD		38,397	38,397
DENNISON LAKE	42,161	63,293	105,454
DIGHTON ROCK		7,920	7,920
DOUGLAS		69,130	69,130
ERVING	14,959	62,872	77,831
FARNHAM SMITH		16,074	16,074
FED. WOMENS CLUB	220	14,415	14,635
F. G. HILLS		6,476	6,476
FREETOWN		19,895	19,895

AREA	CAMPING	DAY USE	TOTAL
GARDNER		5,963	5,963
GEORGETOWN - ROWLEY		7,350	7,350
GRANVILLE	8,672	35,724	44,396
HAMPTON PONDS		67,148	67,148
HAROLD PARKER	31,305	102,370	133,675
HAWLEY		22,970	22,970
H.O. COOK			
HOLLAND POND		69,262	69,262
HOPKINTON		192,876	192,876
LEOMINSTER		64,890	64,890
LOWELL DRACUT		12,390	12,390
LUDLOW			
MARTHA'S VINEYARD		51,586	51,586
MASSASOIT	39,940	34,739	74,679
MOHAWK TRAIL	13,713	126,133	139,846
MOORE		8,081	8,081
MT. EVERETT		22,103	22,103
MT. GRACE		22,270	22,270
MT. GREYLOCK	7,779	183,876	191,655
MT. SUGARLOAF		37,472	37,472
MT. WASHINGTON	972	38,921	39,893
MYLES STANDISH	136,161	133,221	269,382
NICKERSON	230,625	12,844	243,469
OCTOBER MTN.	10,072	50,949	61,021
OTTER RIVER	19,125	31,165	50,290
PEARL HILL	8,190	16,331	24,521
PETERSHAM			
PITTSFIELD	6,371	130,327	136,698

AREA	CAMPING	DAY USE	TOTAL
PLUM ISLAND			
PURGATORY CHASM		45,145	45,145
QUINSIGAMOND-REGATTA		65,075	65,075
" -LAKE PARK		40,795	40,795
RAYMOND J. CALLAHAN		54,269	54,269
ROBINSON		22,807	22,807
RUTLAND		61,474	61,474
SANDISFIELD		13,395	13,395
SAVOY	10,862	21,425	32,287
SHAWME-CROWELL	99,158	48,237	147,395
SKINNER		59,682	59,682
SPENCER		21,225	21,225
STANDISH MONUMENT		25,079	25,079
STREETER POINT		51,728	51,728
TOLLAND	25,148	146,339	171,487
UPTON		18,510	18,510
WACHUSETT MT.		209,563	209,563
WAHCONAH FALLS		57,223	57,223
WALDEN POND		458,865	458,865
WARREN MANNING		2,325	2,325
WATSON		15,472	15,472
WENDELL		21,905	21,905
WELLS	25,227	19,637	44,864
WEST LAKE		3,675	3,675
WHITEHALL		11,619	11,619
WILLARD BROOK	7,316	49,891	57,207

AREA	CAMPING	DAY USE	TOTAL
WILLOWDALE		13,995	13,995
WINDSOR	3,464	8,465	11,929
WOMPATUCK	39,605	473,340	512,945
TOTAL	811,588	4,472,431	5,284,019

BEACH AREAS	CAMPING	DAY USE	TOTAL
FT. PHOENIX		36,783	36,783
HORSENECK	21,948	488,701	510,649
SALISBURY	200,506	258,058	458,564
SCUSSET	56,154	160,678	216,832
HARBOR ISLAND'S	1,490	23,901	35,391
TOTAL	279,998	968,121	1,248,119

SKATING RINKS	DAY USE	TOTAL
BROCKTON	200,684	200,684
FALL RIVER	112,209	112,209
FRANKLIN	117,309	117,309
GREENFIELD	112,894	112,894
HAVERHILL	88,604	88,604
HOLYOKE	101,488	101,488
LOWELL	150,553	150,553
MARLBORO	93,428	93,428
NEW BEDFORD	131,320	131,320
NEWBURYPORT	109,711	109,711
NORTH ADAMS	56,601	56,601
PEABODY	124,593	124,593
PLYMOUTH	128,871	128,871
SPRINGFIELD	102,971	102,971
TAUNTON	93,955	93,955
WORCESTER	103,676	103,676
AUBURN	123,716	123,716
GARDNER VETERANS	165,661	165,661
TOTAL	2,118,204	2,118,204

SWIMMING POOLS	DAY USE	TOTAL
AGAWAM	14,014	14,014
ATTLEBORO	26,161	26,161
BROCKTON	45,023	45,023
CHICOPEE	20,480	20,480
FALL RIVER	30,969	30,969
FITCHBURG	8,649	8,649
HOLYOKE	18,019	18,019
LAWRENCE	30,230	30,230
LEOMINSTER	19,140	19,140
LOWELL	17,683	17,683
LUDLOW	14,486	14,486
MILFORD	20,197	20,197
SOUTHBRIDGE	11,641	11,641
SOUTH HADLEY	12,202	12,202
SPRINGFIELD	19,350	19,350
WESTFIELD	12,720	12,720
WORCESTER #1 (SHINE)	32,571	32,571
WORCESTER #2	35,135	35,135
TOTAL	388,670	388,670

	CAMPING	DAY USE	TOTAL
TOTAL ATTENDANCE AT ALL FACILITIES:	1,091,586	7,947,426	9,039,012

1977 SUMMARY OF REVENUE

AREA	DAY-USE	CAMPING	OTHER	TOTALS
OCEAN BEACHES	249,452.75	263,186.00	33,284.30	545,923.05
SKATING RINKS	1,402,312.49	------	46,533.37	1,448,845.86
SWIMMING POOLS	44,388.75	------	4,881.17	49,269.92
FORESTS & PARKS	425,384.00	660,007.00	139,514.03	1,224,905.03
TOTALS	2,121,537.99	923,193.00	224,212.87	3,268,943.86

AREA	PARKING	CAMPING	WALK-INS	SEASON PASS	BATHHOUSE	PAY PHONE	BUS	CONCESSION	COIN LOCK	MISC.	TOTALS
FT. PHOENIX	2,474.00		163.50	2,430.00							5,067.50
HORSENECK	122,938.00	24,312.00	72.25	13,965.00		34.14	480.00	26,653.00	884.49	331.50	189,670.38
SALISBURY	64,305.00	176,118.00		10,980.00		625.16	220.00	4,595.25		35.00	256,878.41
SCUSSET	28,320.00	62,756.00		2,625.00			480.00	110.76		15.00	94,306.76
TOTALS	218,037.00	263,186.00	235.75	30,000.00		659.30	1,180.00	31,359.01	884.49	381.50	545,923.05

F.Y. 1977 - SKATING RINKS

EA	CHILDREN	ADULTS	GROUP	ICE RENTAL	SPECTATORS WALK-INS	LOCKERS	CONCESSION	SPECIAL EVENTS	STICK TIME	PAY PHONE	OTHER INCOME	MISC.	TOTALS
BURN	3,603.00	8,037.75	402.00	56,315.00	259.00	935.40	400.00	5,377.00		68.64			75,397.7
OCKTON	6,026.00	10,460.25	324.00	88,720.00	219.25	547.00	1,020.00	1,648.75		128.80			109,094.0
LL RIVER	4,158.50	6,259.50	278.00	78,585.00	265.00	961.80		2,669.28		154.10			93,331.1
ANKLIN	3,598.50	4,435.50	686.00	67,440.00	264.25	264.70	800.00	3,395.14				1.20	80,885.2
RDNER	2,569.50	4,108.50	30.00	62,815.00		369.98	501.00	974.50		84.63			71,453.11
EENFIELD	2,174.00	3,253.50	656.00	54,920.00	11.25	141.40	2,350.00	1,539.75		72.55			65,118.4
VERHILL	4,092.25	4,844.25	576.00	63,980.00	122.75	508.60	2,750.02	932.25		60.69			77,866.81
LYOKE	2,805.75	4,020.75	122.00	64,040.00	13.00	347.50	7,242.00	2,053.62		48.45			80,593.07
ELL	4,933.75	8,947.50	246.00	82,640.00	301.00	1,151.40	4,200.00	862.15		41.72			103,323.5
RLBORO	3,508.50	5,312.25	236.00	53,580.00		819.50	505.00	1,711.00		63.23			65,735.4
W BEDFORD	3,241.75	4,497.75	316.00	76,082.00	182.75	643.25	1,550.00	3,275.75		277.90			90,067.1
WBURYPORT	3,499.25	5,558.25	164.00	67,880.00	82.25	395.30	700.00	2,334.25		59.65			80,672.9
RTH ADAMS	1,936.50	4,208.25	502.00	28,590.00	75.00	264.70	1,000.00	752.50		27.33			37,356.2
ABODY	4,615.00	8,035.50	100.00	71,832.00	149.75	546.00	3,025.00			46.57			88,349.8
YMOUTH	3,425.75	4,430.25	8.00	77,265.00	124.00	546.60	2,350.00	761.00		75.95			88,986.5
RINGFIELD	2,930.25	5,945.25	44.00	71,200.00	104.25	389.10	2,700.00	1,448.00		56.76			84,817.61
UNTON	2,737.50	3,999.00	26.00	66,921.00	284.75	411.30	3,290.00	3,067.50		42.20			80,779.2
RCESTER	5,756.25	9,519.75	272.00	55,060.00	116.25	906.00	600.00	2,457.30		90.45	139.50		74,917.5
TALS	65,612.00	105,873.75	4,988.00	1,187,865.00	2,574.50	10,149.53	34,983.02	35,259.74		1,399.62	139.50	1.20	1448845.86

F.Y. 1977 SWIMMING POOLS

AREA	Children	Adults	Pool Passes	Lockers	Pay Phone	Concessions	Misc.	Total
Agawam	898.95	850.00	550.00	90.95		100.00		2,489.90
Attleboro	1,773.15	1,070.50	665.00	192.25		400.00		4,100.90
Brockton	2,576.10	1,422.00	678.00	240.48		101.50		5,018.08
Chicopee	1,117.20	416.00	909.00	182.20		116.00	485.00	3,225.40
Clinton	530.85	92.25	59.00	67.40				749.50
Fall River	2,522.55	409.75	859.00	507.05		700.00		4,998.35
Fitchburg	811.20	126.25	749.00			100.00		1,786.45
Holyoke	1,213.90	594.00	723.00					2,530.90
Lawrence	2,732.95	720.50	600.00	433.05		120.00		4,606.50
Leominster	704.85	91.25	500.00	150.90				1,447.00
Lowell	1,707.30	251.50	247.00			76.99		2,282.79
Ludlow	908.95	175.00	807.00					1,890.95
Milford	1,098.15	432.00	313.00					1,843.15
Southbridge	1,031.60	198.75	357.00	132.05				1,719.40
South Hadley	621.75	326.50	396.00			25.00		1,369.25
Springfield	672.75	90.50	110.00	62.00		156.00		1,091.25
Westfield	1,025.40	407.00	421.00					1,853.40
Worcester #1	1,499.70	669.00	629.00			101.35		2,899.05
Worcester #2	1,669.95	736.75	620.00	238.00		103.00		3,367.70
Totals	25,117.25	9,079.50	10,192.00	2,296.33		2,099.84	485.00	49,269.92

FISCAL YEAR 1977

	PARKING	CAMPSITE	WALK-INS	SEASON PASS	LAND-USE	CONCESSION	HOUSE RENTS	BUS	MISC.	PIER PERMIT	COTTAGE PERMIT	GROUP	TOTALS
AMES NOWELL	1440.00			75.00				60.00					1575.00
ASHLAND	4800.00			1515.00		400.00							6715.00
ASHMERE LAKE											793.00		793.00
BEARTOWN	3160.00	3368.00	12.50	555.00		10.00	534.00	120.00	19.97				7779.47
BRADLEY PALMER	5148.00		.50	90.00		131.00	3005.00	20.00				295.00	8689.50
BRIMFIELD						157.96			22.81				180.77
BUFFUMVILLE	1664.00		53.00	390.00		51.20							2158.20
CHESTER GARDNER	1580.00	6.00	146.00	75.00									1807.00
CHICOPEE	16900.00		326.90	3885.00		521.65		20.00	10.60				21664.15
CLARKSBURG	2758.00	3906.00	3.50	1020.00									7687.50
COCHITUATE	47136.00		1696.25	11850.00				1030.00	138.44				61850.69
D.A.R.	4856.00	10126.00		1065.00		66.97							16113.97
DEAN POND	3682.00		57.50	525.00				120.00				72.00	4456.50
DEMAREST LLOYD	10818.00		.50	1590.00		25.00		140.00					12573.50
DIGHTON ROCK	886.00			90.00		5.00		120.00					1101.00
DOUGLAS	14300.00			1830.00				380.00					16510.00
EAST MOUNTAIN						21146.00							21146.00
ERVING	7000.00	5259.00	125.75	2535.00		5.00		100.00					15024.75
FARNHAM SMITH							2761.50						2761.50
FEDERATED WOMAN'S CLUB	98.00											19.00	117.00
FREETOWN	2110.00			105.00		32.00	960.00	40.00					3247.00
GALLOPS ISLAND						25.00							25.00
GRANVILLE	1772.00	4089.00		75.00									5936.00
HAMPTON PONDS	8700.00		1268.45	1695.00			378.00	20.00	1154.04				13215.49
HAROLD PARKER	9023.00	39376.00	13.00	1110.00		496.10			39.71				50057.81
HOLLAND POND	4296.00			975.00		491.95		80.00					5842.95
HOLYOKE RANGE					39.03								39.03
HOPKINTON	46700.00			12915.00		4011.99		1300.00		10.00		140.00	65076.99
LAKE DENNISON	3800.00	30180.00		1245.00		101.01							35326.01
LEOMINSTER	5940.00		71.75	2070.00				20.00					8101.75
MARTHAS VINEYARD							567.00						567.00
MASSASOIT	2524.00	39404.00		90.00		361.00	582.00						42961.00
MOHAWK TRAIL	3200.00	15885.00		165.00		30.00							19280.00
MONROE												15.00	15.00
MT. GRACE	692.00			45.00								135.00	872.00
MT. GREYLOCK	1162.00	6570.00			1900.00	350.00		40.00	509.71				10531.71

	PARKING	CAMPSITE	WALK-INS	SEASON PASS	LAND-USE	CONCESSION	HOUSE RENTS	BUS	MISC.	PIER PERMIT	COTTAGE PERMIT	GROUP	TOTALS
MT. WACHUSETT						3200.00	1668.00						4868.00
MT. WASHINGTON		289.00											289.00
MYLES STANDISH	18684.00	102046.00		405.00		1340.23	1338.00	1560.00	547.83		36340.00		162261.06
MIDDLEFIELD									50.00				50.00
NICKERSON	3438.00	189158.00				733.75			849.18				194178.93
OAK AMES							2346.00						2346.00
OCTOBER MTN.	420.00	13856.00							41.36				14317.36
OTTER RIVER	1088.00	12052.00		495.00				40.00					13575.00
PITTSFIELD	4660.00	6933.00		210.00	200.00	25.71		160.00					12188.71
PURGATOR CHASM						300.00							300.00
QUINSIGAMOND	1100.00		(B)4100.00			313.12						325.00	5838.12
(LAKE PARK)													
QUINSIGAMOND	2300.00		600.00	735.00				200.00					3835.00
(REGATTA POINT)													
ROBINSON	3600.00			330.00		155.79							4085.79
RUTLAND	8616.00		57.00	2235.00		437.00		40.00					11385.00
SANDISFIELD	1800.00			1095.00				80.00					2975.00
SAVOY MTN.	1640.00	11186.00		180.00		15.00		40.00					13061.00
SHAWME CROWELL	56.00	72302.00				202.15	456.00		221.99				73238.14
SKINNER						25.00							25.00
SPENCER	3400.00			180.00									3580.00
TOLLAND	5442.00	20464.00	8.00	405.00		15.00	738.00						27072.00
OTIS RESERVOIR					219.63								219.63
WALDEN POND	43900.00			6690.00		7474.67	816.00	340.00	369.23				59589.90
WARREN MANNING	414.00		3.75	30.00		15.01							462.76
WATSON POND	5400.00			585.00		65.00		40.00					6090.00
UPTON							450.00						450.00
WELLS	432.00	20104.00				103.96							20639.96
WELLS (STREETER)	3126.00		24.15	945.00		148.73							4243.88
WENDELL	1115.00		3.75	480.00									1598.75
WILLARD BROOK	9300.00	8463.00	37.50	1530.00		214.14	258.00		26.99				19829.63
WILLARD BROOK	4300.00	6748.00		1545.00				460.00					13053.00
(PEARL HILL)													
WINDSOR	2054.00	1911.00	2.25	255.00				80.00					4302.25
WOMPATUCK	278.00	36326.00				30.00	2682.00		320.00				39636.00
TOTALS	342,708.00	660,007.00	8612.00	65,910.00	2,358.66	43,233.09	19,539.50	6,650.00	4,321.86	10.00	37,133.00	1,001.00	1,191,484.11

(A) FOOTBALL FIELD
(B) TENNIS $3,425.00

FISCAL YEAR 1977

	FEE ADMISSIONS	CONTRIBUTION ASSOC. TRUST	PAYROLL REFUNDS	WATER TAXI	SEASON PASS	MISC.	TRAILER FEE	LAUNDRO-MAT	SALE OF LAND	TOTALS
Standish Monument	368.00	28.23								396.23
Office Account			3187.58	500.00	135.00	2078.00			1250.00	6150.58
Walden Breezes						177.56	25775.00	921.55		26874.11
TOTALS	368.00	28.23	3187.58	500.00	135.00	2255.56	25775.00	921.55	1250.00	33420.92

DEM OFFICE OF PLANNING - ANNUAL REPORT

DEM's Office of Planning is located within the Division of Administration and Planning, and has several responsibilities, including preparation and continuous updating of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), planning assistance to various DEM divisions and bureaus, planning and project management of major DEM capital outlay projects, implementation of the State Scenic Rivers program, and graphic design, special projects programming and intergovernmental coordination for DEM. The SCORP qualifies the Commonwealth (and the cities and towns) for approximately $9 million annually in federal assistance for park acquisition and development, and provides a policy framework within which state and federal funds are allocated. The Office is also responsible for project planning and project management for several of DEM's larger capital outlay projects, including Boston Harbor Islands and Lowell Heritage State Parks, as well as the Holyoke Range, Walden Pond and the proposed South Cape Beach development.

Staffing in the Office was reduced from 21 to 3 persons during former Commissioner Woody's tenure. Her successors have begun the job of rebuilding the Planning office staff to resume its former responsibilities, so that by June, 1977, the staff included nine professionals and one clerical person.

The rest of this report will describe the progress made in each planning area during the past year.

SCORP

During fiscal year 1977 the Planning Office completed work on Massachusetts Outdoors, the 1976 Statewide Comprehensive Outdoor Recreation Plan. This plan received approval by the federal Bureau of Outdoor Recreation to qualify the Commonwealth and the cities and towns for two years for $9 million annually in federal open space grants (through the Land and Water Conservation Fund). In addition, the Office prepared a proposal for a 1978 update of the plan which is designed to continue our qualification for BOR funding, and also to meet several critical deficiencies of past SCORP efforts, and meet a number of research and planning needs in the open space and recreation field. The proposal, approved in February 1977, includes four special studies now being carried out by outside planning and management consultants:

- Recreation Barriers Study. This study, scheduled for completion in late 1977, includes surveys and analysis to determine the demand (both actual and latent) for recreational facilities in the Commonwealth. Using a 1600 family survey, this study will determine the relative demand for specific facilities state-wide and for individual regions. A major focus of the analysis will be on the recreational needs of inner-city, handicapped and other special needs for citizens.

- Recreation Access Study. This study will identify the recreation-related transportation needs of these same special needs groups, and will design and cost out several alternative transportation systems for these groups. One such proposal will be developed into an Urban Mass Transportation Administration (UMTA) funding proposal.

- Management Information System Project. This project will involve the design of a management information system for DEM's Office of Planning and for the Division of Forest and Parks.

- Public Participation Study. This project will result in the design and implementation of a public participation process for SCORP based on successful examples in Massachusetts and other states. The study will also identify the characteristics of projects and communities which have used Land & Water Fund assistance.

Two other allied SCORP projects initiated during fiscal year, 1977 included the Regional Demand Study (RDS) and the Massachusetts Open Space Inventory. Massachusetts is the lead state in the 7 state RDS (including the six New England States and New York), which is designed to determine inter-state recreation demand flows, and to develop a state-of-the-art methodology for modeling recreation demand. This project is supported by a $150,000 grant from the U.S. Office of Water Research & Technology. This effort will be important in planning for new recreation facilities, particularly in those areas - such as Cape Cod and the Berkshires - which receive heavy out-of-state traffic.

The open space inventory, designed by the Office of Planning and completed by the Division of Forest and Parks, is the most comprehensive such effort ever conducted in Massachusetts, and will form an important element in the SCORP needs analysis.

Project Planning. During 1976-77 the project planning staff increased from one to four persons, permitting us to carry out essential planning and design activities on DEM's major capital outlay projects.

- Boston Harbor Islands State Park. Early in 1977, a Planning Office report on this project recommended that the Department complete acquisition of remaining MDC and City of Boston islands, and concentrate development on Long Island and two other larger islands. Subsequently, a planner was designated project coordinator for the department on the project, and negotiations were initiated for purchase of the City-owned islands. In addition, Programming was completed and preliminary design begun on three areas of the park, Gallops and Great Brewster Islands, and the Weymouthport peninsula.

- Lowell Heritage State Park. During fiscal year 1977, Planning Office Staff carried out planning and design responsibilities in the implementation of the park master plan (prepared by the Planning Office in 1975). Working closely with the Department's project coordinator, the Office assisted in the development of an 18 month $5 million action program (February 1977-October 1978) for park development. Staff also assisted in programming for and selection of a design contractor for the park entrance node, and prepared a program and preliminary design for the Pawtucket Boulevard node.

- Cape Cod Railroad. The Planning Office prepared corridor plans, preliminary cost estimates and an outline proposal for a demonstration bikeway to be located on this right-of-way (for submission to BOR for a federal P.L. 94-210 90% matching grant).

- Holyoke Range. The Planning Office prepared a visual inventory of the Range as an initial step towards a management plan for the entire range. This plan, to be completed late in 1977, will be used as a model for subsequent DEM forest and park management plans, and will be designed to integrate capital outlay and management activities. This plan will also partially fulfill the requirement for an Environmental Impact report on Forest and Parks' facility regulations.

- Other projects. Additional progress was made on planning and assistance on implementation of other DEM Capital outlay projects, including Walden Pond, South Cape Beach, and others. (In the case of South Cape, the staff continued to work with the park advisory committee on programming and design, despite the Wompanoagsuit against the Town of Mashpee).

- Scenic Rivers. In the latter half of 1976 the Planning staff undertook a survey of scenic rivers efforts in other states, and initiated design of a scenic rivers program for Massachusetts, subject to G.L. ch.21 s.17bEarly in 1977, a decision was made to proceed with the simultaneous completion of a statewide inventory and classification study (as required by the act, and funded through the SCORP project) and a 'demonstration project' designed to implement Scenic Rivers protection on the North River in Plymouth County. Both are expected to be completed by early 1978. Also underway on the North River is a $20,000 National ScienceFoundation funded project to determine the environmental, visual and economic effects on the river corridor of six alternative scenic rivers protective orders and will be succeeded by subsequent designations to create a 25 to 30 river Scenic River system for Massachusetts.

Special Projects

In the past year, the Planning Office has undertaken a number of varied special projects for the Commissioner and for various divisions, including the following:

- Special Events. The Planning Office initiated or helped coordinate arrangements for several special events including the visit by Captain Cousteau, Governor Dukakis, and Secretary Murphy to the Harbor Islands in April, 1977, the 'Lowell Day' visit by Lt. Governor O'Neill, Secretary Murphy and others to the Lowell State Heritage Park in June, and the BOR North East regional meeting in Lowell in March. In addition, the Office prepared graphics and presentation materials to accompany these events, including a Harbor Islands exhibit for the Cousteau Involvement Day, and a slide show on the Lowell Park development.

- Graphics. The staff has prepared graphic materials and brochures to promote and describe a number of department activities, including brochures on the Lowell and Boston Harbor Islands Park developments, a wood products exhibit, and the afore-mentioned Harbor Islands exhibit. In addition, the Office prepared a proposal for a coherent DEM logo-graphics-signage system, parts of which are already implementated.

- Program Development. The Planning Office has developed or planned a number of new and innovative programs for the Department, including the Earthwatch field research project on the Boston Harbor Islands, the Volunteer Naturalist program at four different park and forest locations and a Massachusetts Natural Heritage Program. The Earthwatch program was initiated to bring Earthwatch, (a private, non-profit organization which organizes and finances scientific field research throughout the world) into research activities on the Harbor Islands. The program will be implemented during spring and summer, 1978. The Volunteer Naturalist program was designed and implemented in spring and summer, 1977 to permit volunteer naturalists to give nature walks and lectures in DEM forest and park facilities. The Natural Heritage program, to be implemented in 1978 was initiated in conjunction with the Nature Conservancy (a nation-wide non-profit land conservation organization) to locate and plan for the protection of unique and endangered natural areas within the Commonwealth.

- Special Studies. Under Title III Water Resources grant, the Planning Office undertook a Water Requirements Study for the Commonwealth. This study uses a computerized modeling approach to predict water needs for future population and industrial growth in Massachusetts. Development of the model and information gathering were completed by spring, 1977, with programming and preliminary findings to be developed by September, 1977.

- Federal Aid/Intergovernmental Coordination.

The Planning Office maintains the department's coordination with the federal Bureau of Outdoor recreation in conjunction with the Commissioner's role as State Liaison Officer. In addition, the Office prepares the Department's grant applications for BOR and other federal funds. The Planning Office also manages DEM comments on projects undergoing A-95 and 208 review.

ANNUAL REPORT OF THE BUREAU OF SOLID WASTE DISPOSAL FOR FY1977

I. Introduction

The disposal of solid wastes has presented a continuing problem for the majority of the Commonwealth's cities and towns. The traditional methods of landfill and incineration have not provided a solution. Eighteen incinerators in the state have been closed due to failure to comply with increasingly strict air pollution regulations, and only 200 of an estimated 350 landfills currently meet the landfill regulations. Many of these are rapidly reaching capacity. Communities throughout the Commonwealth are faced with critical decisions about what to do with their solid wastes in light of stricter environmental regulations, rising costs, decreasing land availability, and spiralling budgets. With few exceptions, current disposal practices are inadequate from both a resource utilization and environmental viewpoint. An increased awareness of the limitations on natural resources is leading to a public demand for the conservation and wise utilization of existing resources and the protection of the natural environment.

II. State Program

Recognizing that communities need assistance in finding solutions to their collective problem, the Commonwealth established the Bureau of Solid Waste Disposal (Section 20, Chapter 16 G.L. of Mass.), now within the Office of Environmental Affairs. Since its inception in 1969, the Bureau has sponsored several surveys and studies on the extent of the Commonwealth's disposal needs. Each of these studies has indicated the desirability of resource recovery. As a result of these studies, the Solid Waste Management Plan developed in 1975, recommended a statewide approach to regionalizing solid waste management. That Plan recommended that the Bureau sponsor the implementation of privately financed, constructed and operated resource recovery facilities throughout the Commonwealth. The Bureau acts as a catalyst in the implementation of the systems in order to assure the selection of the best alternative based upon the most appropriate combination of technology, markets, scale, etc. Specifically the Bureau provides the "front end" planning work necessary to assist the communities in addressing the complex technical, institutional, procurement and financial issues involved in resource recovery implementation. Further, the Bureau is authorized to purchase land to be leased to private persons or firms for construction, operation and maintenance of the facilities.

In its role of promoting resource recovery facilities, the BSWD is also conducting studies on the potential utilization of residues from resource recovery. The Bureau has also investigated measures such as manditory deposit legislation and methods to assist communities in carrying out source separation programs.

III. Project Activities During FY 77

Four regional efforts are currently being supported: The Northeastern Massachusetts Resource Recovery Project to serve some 50 communities in Northeastern Massachusetts, the 128 West Refuse Recovery Council to serve western and southern suburban Boston; the Central Massachusetts Regional Solid Waste Project , to serve the Greater Worcester area; and the Greater Springfield Regional Resource Recovery Project. Of these, the Northeastern Massachusetts Project is furthest along in the planning stages, and is described more fully below. The 128 West and Central Massachusetts projects are in various stages of site, technology and scale deliberations, and expect to be issuing Request for Proposals in the late fall. The Greater Springfield project is in the formative stages. Aside from the regional resource recovery projects the Bureau has also done research in the past year on recycling, source reduction and residue utilization. These activities are also briefly described below.

A.) North East Resource Recovery Project

The Northeast Massachusetts Project is an outgrowth of the efforts of five communities in the Greater Lawrence area who approached the Bureau in 1972 with a request for assistance. Consistent with its Plan, the Bureau recommended that the communities pursue a resource recovery system that was large enough to accomodate the needs of all residential, commercial and non-hazardous industrial waste generators in Northeastern Massachusetts and southern New Hampshire. The communities concurred with the recommendation and formed the Northeast Solid Waste Committee (NESWC) to pursue planning. A Request for Proposals was issued in December 1974 to solicit proposal from industry to design, construct and operate a resource recovery facility that would provide full disposal services for a period of 20 years. In March 1975, six proposals were received for evaluation. Of these, essentially two different technologies were offered, with variations in each: waterwall incineration for the generation of electric power; and refuse derived solid fuel processing to be used as a supplement to fossil fuels in utility or industrial boilers. Following a comprehensive evaluation of each proposal on its technical, environmental and economic merits, UOP Inc. of Des Plaines, Illinois, was selected to build and operate a 3000 ton per day facility to produce electric power for sale to the Massachusetts Electric Company.

Since the selection in 1975, the NESWC member communities, now numbering 31, have selected a site in North Andover upon which to construct the facility, and have been negotiating over the past year with UOP to develop a standard, uniform contract to be submitted to some 50 communities in Northeastern Massachusetts for their review and approval. Contract negotiations are essentially complete, and the contract will be presented to community officials in the fall. In the interim, NESWC is devoting its attention to developing a mechanism by which transportation sharing can be best effected. Basically, the concept, which was adopted by NESWC this spring, means that all communities who dispose at the

facility will share the major costs incurred by each community in transporting its wastes to North Andover, based upon an efficient, economical transportation system of transfer haul. The concept of transportation sharing was created in order to encourage far distant communities in Northeastern Massachusetts (some 30-40 miles from North Andover) to dispose at the facility, so that all participating communities can benefit from the economies of scale in solid waste processing.

In order to begin the three year construction and shakedown phase of the facility, some 1800-2000 tons per day of waste must be contractually committed for 20 years. It is anticipated that this will occcur during the next 6-12 months, and the facility could commence full scale operation in 1981.

During FY 77, the Bureau's activities on the Northeastern Massachusetts Project were primarily directed at aiding NESWC in the selection of the North Andover site after the rejection of the Haverhill site and in the negotiation of a contract between UOP and the communities. The Bureau's major activities during FY 78 on this project will be the orientation of municipalities on the contract to secure contract commitments and on the preparation of a final Environmental Impact statement for the Project.

B. 128 West Refuse Recovery Project

After a delay of over a year in securing site nominations from the twenty-eight member communities of the 128 West Refuse Recovery Council (128 WRRC), the project has gained momentum. Six communities nominated a total of eight candidate processing facility sites by the April 1, 1977, deadline. The technical committee of 128 WRRC narrowed the potential sites down to four, located in Bedford, Sharon, Stoughton, and Weston. These are now being reviewed in detail by 128 WRRC. A preliminary report summarizing the review of these sites by various State Agencies was submitted to the council in the beginning of July. The 128 WRRC is also investigating questions regarding scale and technology. A report from MITRE Corporation, which will provide an assessment of the economic implications of various scale and technology decisions, is expected by the end of September.

The 128 WRRC plans to make decisions regarding site choice, scale, and technology in the fall paving the way for a Request for Proposals before the end of this year. During FY 77 the major efforts of the Bureau on this project were aiding the 128 WRRC in securing site nominations, coordinating review of nominated sites, and investigating the trade-offs between large and small-scale facilities of different types. The emphasis of the Bureau's activities on this project in FY 78 will be the completion of the site selection phase of the Project, preparation of a Request for Proposals (RFP) and aiding in the evaluation of Bid Proposals.

C. Central Massachusetts Resource Recovery Project

The CMRRP is currently at the point where decisions must be made as to which way to go. Twelve sites were nominated and reviewed for a resource

recovery facility. Of these, four finalist sites were selected; two in Worcester and two in Millbury. None of these are co-located with a large energy user. Further analysis is currently under way to review the economics of potential alternatives and the possibility of increasing the service area to include Greater Springfield and or the Framingham area. A status report on the project and potential alternatives by MITRE Corporation is now being reviewed by the Central Massachusetts Solid Waste Committee (CMSWC).

Should the CMSWC react favorably to the potential for resource recovery in the analysis materials presented to them they could be prepared to begin the process of requesting proposals, late in the fall of this year.

During FY 77, the Bureau's major activity on this project was the completion of the site evaluation and selection process and the investigation of potential technological options available. If the decision in the fall of this year by CMSWC is to go forward with a Resource Recovery Project the Bureau's FY 78 efforts will be the preparation of an RFP and the evaluation of proposals received

D. Greater Springfield Regional Resource Recovery Project

The GSRRRP has just begun the exploration into the possiblities for resource recovery in the Connecticut Valley Area. To date all that has been completed is the organization of the project study group and the determination of the potential scope of the solid waste management problem in the region. Other than reviewing analysis work which the Bureau and MITRE will provide, this project will not move rapidly until after the November elections. Several candidate for public office in the area all claim to have different solutions to the solid waste problems, making it difficult for the communities to work together in a rational way. The Bureau's major activities on this project in FY 77 has been aiding the establishment of a regional group and the evaluation of potential resource recovery options available to the region. During FY 78 the emphasis of the Bureau's efforts will be on securing site nominations, evaluation of sites, and site selection.

E. Source Separation

Source separation is widely practiced in Massachussetts. In order to provide technical assistance to communities in establishing, expanding or improving source separation programs, the Bureau of Solid Waste Disposal has conducted surveys of recycling programs during the past year. A preliminary survey of municipal officials from every community indicated that 183 out of 351 cities and towns in the Commonwealth had some kind of recycling programs. To date, a detailed survey has been obtained on 124 of those 183 programs.

The Bureau of Solid Waste Disposal has also researched an office paper recycling program for State Office Buildings. A pilot program is in the process of being implemented.

The strategy with respect to source separation is to aid municipal officials, organizations, and other groups in establishing, expanding, or improving local source separation programs by providing technical assistance. This assistance will be in the form of information in program implementation options, economics, and markets for recycled materials. In order to carry out this function effectively, the Bureau of Solid Waste Disposal will update its data base on recycling programs at least once a year.

The Bureau of Solid Waste Disposal will continue to maintain at least one staff expert on source separation programs to serve as an information source. In order to actively disseminate information on source separation, the BSWD will distribute reports on its surveys and analysis and also sponsor conferences. The first such conference is scheduled for October 27, 1977.

Compatibility of source separation programs with Resource Recovery, Programs is another area where the BSWD will continue to take an active role. As was done on the Northeastern Massachsetts Resource Recovery Project, the impact of continued and expanded source separation programs on the economics and viability of resource recovery will be thoroughly investigated and groups involved in recycling will be made aware of and invited to participate in contract negotiations to insure that the highest degress of compatibility between the two types of programs is established.

The Bureau's FY 78 activities on source separation will be to continue and expand the above described activities.

F. Source Reduction.

While no existing legislation for the Commonwealth addresses source reduction, legislation relating to refundable deposits for beverage containers (Bottle Bill) has been introduced several times and in 1976 legislation relating to packaging review was also introduced. In November 1976, a statewide referendum on the "Bottle Bill" was narrowly defeated by .07% of the vote (20,000 votes). The Bureau of Solid Waste Disposal has researched the impact of a Bottle Bill on resource recovery and prepared a summary report which indicates that a refundable deposit program need not have any serious impacts on resource recovery programs and in general would be desirable.

Efforts to aid the proliferation of source reduction measures will continue to be supported by activities of the Bureau of Solid Waste Disposal during FY 78. With respect to refundable deposits, the Bureau will support and assist in future efforts to establish statewide legislation and also aid in the implementation of a beverage container deposit program in state facilities.

Other activities toward source reduction will be research by the BSWD on methods to control packaging, methods to provide effective labeling which would give consumers the opportunity to determine which products are better from a resource conservation viewpoint, and public education toward resource conservation through source reduction.

G. Residue Disposal

The major thrust of the BSWD research program is to develop methods to for the final disposal of residue such as ash, flyash, cinder and other materials from such facilities as the proposed Northeastern Massachusetts Resource Recovery Plant. In anticipation of such residue the BSWD contract with Camp Dresser & McKee (CDM) to investigate the use of incinerator residue of other useful purposes and to develop a program to demonstrate and test these alternatives to sanitary landfill of the residues. Specifically CDM has investigated the use of incinerator residue as a final cover material for sanitary landfill or for reclamation of other areas, its use in roadway construction, and the effects of storage of the residues in confined area of a given site.

The proposed approach to be used in this work is the development of a residue utilization and monitoring program at the landfill site of the Harold Parker State Forest in North Andover, Massachusetts. This includes utilization of incinerator residue as final cover for the landfill and reconstruction of the roadway into the site utilizing the residue for the base and in the pavement. Also, a conceptual site development plan has been prepared based upon the same principles for a 150 acre former anti-ballistic missle site adjacent to the Boxford State Forest in North Andover, Massachsuetts. This conceptual plan is intended to evaluate the suitability of the residue to reclaim a site for recreational purposes including the development of landforms, and to consider those measures which must be taken to provide a storage area for residue prior to its later intended use.

The Bureau has also been working on an experimental project to determine the effects of the placement of bottom ash residue from the combustion of solid waste on a wetland border. Environmental observations will be made of the effects on water, vegetation, wildlife, air quality and ability of natural vegetation to survive in the vicinity and to invade the area to establish new growth. Further experimentation with bottom ash residue will examine its use in secondary and primary road construction, in the reclamation of abandoned sanitary landfill, and in plant hsubandry and nursery work.

New Program Activities During FY 78

The Resource Conservation and Recovery Act of 1976 (Public Law 94-580) will expand the activities of the Bureau of Solid Waste During FY 78. While continuing the projects described in the previous section, the Bureau will also become involved in the planning for sludge, septage, special and hazardous waste management in order to fulfill the mandates of this new law.

Since many of these new activities of other state and regional agencies, a Task Force has set up to aid in the administration of all responsibilities of 94-580. This task will submit a State Solid Waste Management Plan to EPA on Oct 1, 1978 which will delineate all the present and programmed activities of the Bureau of Solid Waste Disposal.

The Commonwealth of Massachusetts
Leverett Saltonstall Building
Government Center
100 Cambridge Street, Boston, 02202

ANNUAL REPORT
to the
MASSACHUSETTS WATER RESOURCES COMMISSION
by the
Director and Chief Engineer
Division of Water Resources
for the
Fiscal Year Ending - June 30, 1977

PUBLICATION #9926-25-100-9-77 CR
APPROVED by Alfred C. Holland, State Purchasing Agent

INTRODUCTION

Chapter 21, Section 8 of the General Laws of the Commonwealth, enacted in 1956, established the existence, the duties and the jurisdiction of a Water Resources Commission under whose supervision and control would be the Division of Water Resources. Subsequently, in 1966, Chapter 685 established a Division of Water Pollution Control as the second operating agency of the Commission. The current make-up of the Commission was instituted pursuant to Chapter 706, of the Acts of 1975, which extensively amended Chapter 21.

The mandates were clear The Commission was charged with the responsibility for the study of the needs, supplies and resources of the Commonwealth with respect to private and public use of water, water conservation and flood damage prevention

This report intends to summarize the progress by the Division of Water Resources during Fiscal Year 1977, in response to those mandates.

Supervisory responsibility for the Division is incorporated in the following individuals who constitute the Water Resources Commission as of June 30, 1977.

Co-Chairman - Richard E. Kendall, Commissioner
Department of Environmental Management

Co-Chairman - David Standley, Commissioner
Department of Environmental Quality Engineering

Department of Food & Agriculture Representative -
Frederick Winthrop, Jr., Commissioner

Designee: Myron A. Maiewski, Assistant Commissioner
Department of Food & Agriculture

Department of Commerce & Development Representative
John J. Marino, Commissioner

Designee: William Sugrue (Interim)
Department of Commerce & Development

Department of Fisheries, Wildlife & Recreational Vehicles Representative
Bruce Gullion, Commissioner

Department of Metropolitan District Commission Representative
John Snedeker, Commissioner

Designee: Francis D. Faucher, Assistant Director
Water Division
Metropolitan District Commission

Public Members - Peter C. Karalekas
322 Prospect Street
East Longmeadow, Ma 01028
Appointment expires - 11/29/77

Alan S. Murphy, Jr
85 Kingswood Dr.
Westwood, Ma 02090
Appointment expires - 12/15/78

Richard Noss
106 Centre Street
Milton, Ma. 02186
Appointment expires - 11-29-79

Rita Barron
76 Walden Street
Newtonville, Ma. 02160
Appointment expires - 11/29/78

PERSONNEL OF THE DIVISION (as of June 30, 1977)

Kennedy, Charles F.	Director & Chief Engineer
Pyle, O. Fletcher	Associate Civil Engineer
Doucette, Thomas F.	Associate Civil Engineer
Chandler, Emerson H.	Chief Planner
Beshara, Michael L.	Principal Civil Engineer
Krol, William A.	Senior Civil Engineer
Shapiro, Sheldon	Principal Civil Engineer
Maguire, Kevin B.	Senior Civil Engineer
White, Paul F.	Resources Planner
Bones, William F.	Resources Planner
Connor, Joseph M.	Assistant Planner
Hardin, Meriel N.	Resources Planner
Rawls, Margaret	Land Use Administrator
Wineman, Janet J.	Principal Planner
Tamulonis, Ronald	Senior Civil Engineer
Hazel, William I.	Assistant Civil Engineer
Daniels, John H.	Land Use Administrator
Grice, David	Resources Planner
Levine, Nathan R.	Senior Civil Engineering Draftsman
Goldman, Charlotte	Senior Clerk Typist
Hayward, David F.	Principal Right-of-Way Agent
Struzziero, Ernest J.	General Construction Inspector
Kilner, Suzanne M.	Land Use Administrator
Everberg, William M.	Senior Civil Engineering Draftsman
Tanzer, Philip	Senior Statistical Clerk
DiCesare, Richard	Senior Bookkeeper
Brosnahan, Helen R.	Principal Clerk
Mathews, Barbara A.	Junior Clerk Typist
Connell, Evelyn	Junior Clerk Typist

ADMINISTRATIVE APPROPRIATIONS

Fiscal Year	Appropriation
1959	$ 70,800
1960	75,915
1961	79,475
1962	88,920
1963	117,402
1964	129,649
1965	139,181
1966	140,573

Administrative Appropriations - continued

Fiscal Year	Appropriation
1967	127,946
1968	153,411
1969	190,412
1970	174,705
1971	202,740
1972	213,808
1973	227,300
1974	247,899
1975	259,854
1976	262,155
1977	345,000

In addition, the following sums were appropriated for the operation of Interstate Flood Control Commission:

Connecticut River Valley Flood Control Commission	$ 35,575.00
Merrimack River Valley Flood Control Commission	111,925.00

These funds were used for the payment of the Commonwealth's share of operating the respective Flood Control Commissions and the annual tax and economic losses to the upstream states caused by the construction of flood control reservoirs.

Other Major Appropriations:

Water Planning	$ 48,907.00
Flood Control	108,244.00
P. L. 566 Maintenance	33,000.00
Federal Cooperative Studies	137,000.00
New England River Basins Commission	44,483.00
Ipswich River Watershed District	1,000.00

TOTAL BUDGET APPROPRIATION

Fiscal Year	Appropriation
1977	$ 865,134.00

Regional Interstate Comprehensive Water and Related Land Resource Planning

Interstate studies were conducted during FY 77 which involved the Commonwealth, other states and Federal Agencies. Most of these studies were under the leadership of the New England River Basins Commission, or the New England Division of the U. S. Army Corps of Engineers.

Two major reports were completed, The River's Reach (Connecticut River) and The Merrimack Water Supply Project Technical Report. The River's Reach, a 292 page document, presents a unified program for flood plain management in The Connecticut River Basin, and amends the NERBC 1980 Connecticut River Basin Plan. Basically, the study grapples with alternatives to the structural flood control measures originally proposed, but which now are seen to be unfeasible because of political, environmental and economic factors.

While plans for large upstream dams have been put aside, the raising of dikes to protect Springfield, West Springfield and Hartford is still a possibility. While the present dikes offer a high degree of protection, they would be overtopped by a flood of the magnitude of the Standard Project Flood. In this event, losses would be catastrophic.

The River's Reach, therefore, recommends that an additional study, now ongoing, determine if dike raising is economically or otherwise justified, and if the cities themselves find the present level of risk unacceptable. Upon completion of these studies, Chicopee, Holyoke and Northampton, also behind dikes, may wish to re-evaluate their position.

Non-structural alternatives examined by the study include improved flood warnings, relocation and flood proofing, regulation, flood insurance, land acquisition, maintenance of agriculture and guidance of growth. The issues of leadership and implementation responsibilities, and cost-sharing approaches are discussed.

The study concluded that the success of a comprehensive non-structural program may well hinge on the availability of Federal financial assistance under Section 73 of the Water Resources Development Act of 1974, PL. 93-251. With a maximum non-federal share of only 20 percent, it is an attractive proposition for the states. The workability of this approach must be demonstrated at the Federal level.

The study, therefore, recommends that special "Section 73" demonstration studies be conducted "... to develop the data and methodology needed to satisfy the Office of Management and Budget's restrictions about planning cost effective flood plain management programs."

While the River's Reach was produced by a state-federal team with formal participation by Division of Water Resources personnel on the Coordinating Group and Study Management Team, the Merrimack Study was primarily conducted by the Corps of Engineers, New England Division, Water Resources personnel participated in study briefings, discussions of preferred alternatives and in the review of various draft materials. Participation by the Metropolitan District Commission and The Division of Fisheries and Wildlife was also obtained.

The Merrimack River Water Supply Project Technical Report, January, 1977, was produced in compliance with the larger Northeastern United States Water Supply Study (NEWS) authorized by Congress under Title I of Public Law 89-29, enacted on 27 October 1965.

Built upon a base of prior water planning reports, the study describes the basin and its resources, its problems and needs. It formulates short and long range water supply alternatives, including non-structural elements such as demand reduction, desalination, recycling, as well as structural additions to water supply. The Sudbury River, Merrimack Mainstem, and Plymouth County Groundwater Sources appear to be worthy of future considerations, but desalination and importation from the Connecticut Basin, beyond the proposed Northfield and Millers River developments, do not rank favorably as long term water supply solutions for eastern Massachusetts

The report concludes " . . That water demand modification - through consumer education and the increased use of water-saving appliances - are cost effective and should be considered components of any plan designed to meet the long term needs of the eastern Massachusetts region. "

A New England Perspective on Flood Plain Management (2 volumes) was completed to draft stage during the year. Produced with Division of Water Resources staff participation as a member of the NERBC Task Force on Floodplain Management, the report is intended to be an element of the Comprehensive Coordinated Joint Plan for New England pursuant to The Water Resources Planning Act of 1965.

The study is aimed to provide a unified approach to floodplain management in keeping with the recent Presidential Order "to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains."

The Plan of Work for the Pawcatuck Narragansett Bay Urban Study received Washington approval early this past year. As a result, work on most study elements is well underway. The Massachusetts portion of this study includes a rigorous examination of urbanized watershed area needs in the areas of flood plain management and water supply. Acceptable, implementable solutions to these serious problems will be the end product of this joint Federal/State effort.

Reports, Publications and Documents FY 1977

U. S. Department of Agriculture and Massachusetts Water Resources Commission, Inventory of Potential and Existing Upstream Reservoir Sites Sudbury, Assabet, and Concord Study Areas, October, 1976, 87 pages.

U. S. Department of Agriculture and Massachusetts Water Resources Commission, Water and Related Land Resources of the Berkshire Region, Amherst, 1977.

New England River Basins Commission, Task Force on Flood Plain Management, (with participation by the Division of Water Resources), New England Perspective on Flood Plain Management, Vol. II, Assessment of Flood Plain Management Activities in New England, June 30 1977.

New England River Basin's Commission, (with Division of Water Resources participation), The River's Reach, A Unified Program for Flood Plain Management in The Connecticut River Basin, December, 1976,

State Planning and Accomplishments

State water planning activities during Fiscal 1977 can be classified in four general categories: basic data acquisition, regional resources evaluations, Level B and C studies led by the New England River Basins Commission or federal agencies, and overall water plan/policy studies led by the Executive Office of Environmental Affairs.

Basic data gathering, including rainfall recording, stream gaging, snow surveys and flood monitoring, continued routinely as required to provide the necessary foundation for detailed water supply and flood control planning. No new stations were acquired during the year but the Commission continues to operate a system of rainfall stations, the total number of rainfall stations remaining at 199 in Massachusetts The position of State Climatologist was established in the Division of Water Resources to maintain statistical records on general weather conditions. Although the position is not funded, Division personnel keep the records up-to-date on a part-time basis. The rainfall for calendar year 1976 is shown and compared with the normal rainfall. This service is valuable to engineers, students, architects, and the legal profession.

Regional resource studies may be based primarily on watersheds, groups of watersheds, or in some cases, groups of towns. A listing of such studies or planning activities includes the following:

Ipswich River District Water Supply

The firm of Metcalf and Eddy Inc. has been engaged by the Ipswich River Watershed District Commission in cooperation with the Massachusetts Water Resources Commission to investigate appropriate methods of management of the Ipswich River water supply by regulation and allocation of its groundwater well supplies and surface water flow. The study shall include a review of the presently authorized withdrawals from the Ipswich River. This data would permit an evaluation of the optimum location, amount and timing of withdrawals to meet the needs of the year 2000 for each community and would provide a sound basis for allocation or reallocation of available stream flow. Finally, recommendations for any follow-up studies needed to formulate a program for developing the necessary additional supplies for the year 2000 would be made based on the allocation plan presented.

Wetlands Restriction Program

During Fiscal Year 1977 the staff of the Wetlands Restriction Program was enlarged and re-organized in an effort to expedite the implementation of M.G.L. 131/40A and M.G.L. 130/105. Field personnel were assigned responsibilities for communities in the Nashua River, Charles River and Barnstable County areas. The inland program is continuing, while the coastal program should be strengthened with funding from the Coastal Zone Management program. In addition, a staff member is now working on the Scenic Rivers program.

The problem of flood plain mapping in consideration of the 1974 amendment to the Inland Wetlands Act was resolved in the Charles River Watershed by limiting the restrictions to wetland mapping. The Corps Natural Valley Storage areas, when completed, would cover the largest areas of flood plains. The contracts for wetland mapping in the Charles and Nashua Watershed were awarded to Resource Mapping Systems, Inc., during March and April. In the Nashua, both wetland and flood plain areas will be placed under restriction.

The accomplishment of the staff for Orders of Restriction during FY 77 included the following: recordings completed, Orleans and Newton; hearings held Newton, Marlborough, Millis, Norfolk, Chatham, Weston, and Sherborn; preparation for hearings, Provincetown, Dennis, Brewster, Holliston, Natick and Wrentham.

Cape Cod Hydrologic and Other Ground Water Studies

The comprehensive study of ground water resources of Cape Cod, Massachusetts, continued during FY 77. Fieldwork is essentially complete and an atlas report is in progress as is construction and verification of the digital model. The four year, $700,000 study funded jointly by Barnstable County, the Massachusetts Water Resources Commission, USGS, and the National Park Service is being performed by the USGS. The Massachusetts Water Resources Commission will continue administration of the funding and conduct of the study through close coordination with USGS, the Barnstable County Commission and the local Barnstable County Task Force toward the objective of testing alternative methods of developing and managing the ground water of Cape Cod. The study is scheduled to be completed by the end of FY 78.

Under the "Atlas Program" funded jointly by the U. S. Geological Survey and the Massachusetts Water Resources Commission, progress was made on several basin studies during FY 77. The review of three atlas reports for Northeast Coastal basins(Mystic, Shawsheen, lower Merrimack) was completed and are awaiting the Director's approval. Fieldwork is continuing on schedule for the Su As Co basins and on Martha's Vineyard. The Atlas Report for Nantucket was completed and is now under review. On Nantucket, a deep water-resource and stratigraphic test near the center of the island has encountered freshwater at greater depth than predicted. The implication of this discovery is that under similar circumstances, freshwater may remain trapped under extensive areas of the Continental Shelf.

Overall Water Plan Studies

Massachusetts Water Supply Policy Study

The Division, as a member of the study team headed by the Office of Environmental Affairs, was involved in the completion of the Massachusetts Water Supply Policy Study. The consultant firm of Wallace, Floyd, Ellensweig and Moore, Inc., Architects/Planners, conducted a literature search for water supply problems, issues, current policy, current objectives, current conditions and criteria guiding present operations and planning. The document examines the need for sound state policies and recommends several policy packages for consideration. Among its many recommendations is the strengthening of this Division so it would be better able to prepare and maintain an assessment of water resources by watershed areas; to coordinate and guide watershed planning; to administer technical assistance and grant programs; to prepare "water budgets" and plans for all water used, including recreational water; to advise the Secretary of Environmental Affairs on water rights and water allocation questions; to develop a formal process to deal with interbasin transfers and recommend agreements acceptable to all parties in specific interbasin transfer cases; to monitor stream, pond, lake and aquifer withdrawals and the treatment thereof; to review local water rates and to regulate and administer such other matters as may affect the public health, safety and welfare. This would also include the provision of technical assistance to local communities, for advising on local supply options, for securing federal and other grant programs, and for conducting conservation programs. It would also initiate state level responsibilities for broad, long-range water supply planning, coordinating with regional planning agencies and using defined watershed areas for basic analysis.

Massachusetts Water Resources Study

The Type IV Massachusetts Water Resources Study, a cooperative effort between the U. S. Department of Agriculture and the Massachusetts Water Resources Commission, is being conducted to provide information and technical data for a comprehensive plan for the development and use of the Commonwealth's water and related land resources. Investigations and analyses cover such items as identification of potential and existing upstream reservoir sites, determination of present land use with projections for future land use, identification of selected flood-prone areas, with alternatives for providing flood protection, identifications of existing wetlands in selected areas based on soils, and delineation of selected flood plains.

Four regional reports, Berkshire, Connecticut, Central and Coastal, will be prepared as part of the study. The Berkshire region report was published during FY 77. A draft for the Coastal was released and one for the Central region is imminent. Specific items considered in each study area are land use, flood damages and protection, erosion and sediment, recreation, fish and wildlife, wetlands, water supply, and water quality. These documents are intended for professionals in local, state, and federal agencies in planning for the conservation and development of water resources.

Public Lakes, Ponds, and Reservoirs

The Division's staff is completing an inventory of water bodies with emphasis being placed on determining their public or private status. The Berkshire region was completed and included as part of the final report in the Type IV study. An inventory was completed during FY 77 for the North Shore, Ipswich, Neponset, Parker, Taunton, Buzzards Bay, Narragansett Bay, Cape Cod and Islands study areas of the Coastal region. The South Shore and Nashua study areas were in the process of being inventoried. A review of all these study areas by pertinent agencies will be completed in FY 78.

Coordination

Coordination during the fiscal year included formal contacts with all 13 Regional Planning Commissions and 253 of the Commonwealth's 351 cities and towns. These contacts were primarily to give notice and solicit local participation in the Statewide Massachusetts Water Resources Study conducted in cooperation with the U. S. Department of Agriculture. A serious effort is being made to achieve consistency between water planning studies and other state planning efforts, such as the work of the Office of State Planning and the State Comprehensive Outdoor Recreation Plan.

Coordination and review of all Federal grant program applications is obtained by full participation in the A-95 review procedures. Applications which appear to relate to Water Resources interests are requested and scrutinized.

The Division is now less directly linked to the administration of the New England River Basin Commission (NERBC) but staff participation in coordinating groups and study management teams continues. Reorganization has made it possible for the Secretary of the Executive Office of Environmental Affairs to assume the position of vice-chairperson of the NERBC replacing the Chairman of the Water Resources Commission.

Coordination with the Water Resources Research Center at the University of Massachusetts is afforded by a continuing program of research project review.

Graphic Arts Projects

1) Routine graphic work of the Division.

2) 2nd edition revision of Chapter 111 Groundwater Study Report titled, "Groundwater & Groundwater Law in Massachusetts.

3) Manuscript of Wetlands Plant Manual.

Outside activities included exhibit and graphic work for the Department of Environmental Management, Division of Law Enforcement and Mass. State Employees' Blood Bank, being the only Graphic Artist within the Executive Office of Environmental Affairs. As of July, 1977, the Graphic Artist will be transferred to DEM as Public Information Officer, but will hopefully continue to meet the needs of the Division of Water Resources.

208 Planning Assistance

Areawide Wastewater Management Planning is mandated by P. L. 92-500, Federal Water Pollution Control Act, 1972 Amendments, has moved into the final management plan stage this past year. Nine of the Commonwealth's Regional Planning Agencies have made varying degrees of progress towards developing final local and regional solutions for managing point and non-point pollution sources entering receiving waters.

During the past fiscal year, the Division has dealt principally with five of the Regional Planning Agencies. Considerable staff effort has been spent on reviewing program output reports, serving on technical planning committees and in-putting to a state-directed program to effectuate 208 planning in non-designated geographic planning areas. Staff input has had particular focus on reviewing ground water investigation, water usage and non-point source analysis work reports. The current stage of section 208 planning has steered Division review efforts into the legal/institutional issues of management plan implementation. Socio-economic, fiscal and governmental authority impacts of proposed pollution abatement management plans are becoming the current considerations for analysis and comment.

Highway Planning and Environmental Assessment

The Division continued its involvement with the Department of Public Works Interagency Environmental Impact Committee this past year A staff member is assigned to this committee which serves as an interagency clearing house for the review of all highway and bridge construction projects requiring environmental impact reports. The staff takes the responsibility of analyzing potential project impacts on stream hydrology, flood plains, wetland areas and ground water. Technical assistance and review is directed at other considerations such as runoff control, water supply protection, and stream channel capacity effects. Three of the projects reviewed in the past year include the Southwest Corrider, Route 2 Expansion and the Final Environmental Impact Statement on the DPW Snow and Ice Control Program.

Small Watershed Flood Prevention Planning (PL 566)

Watershed work plan revisions continued during FY 77 on the Washington Mountain Brook and Upper Quaboag River PL 566. The environmental assessment on the Moose Hill multi-purpose reservoir project was completed. The West Branch of the Westfield and Avon-Braintree-Holbrook-Randolph flood control projects had continuing environmental assessments conducted this year. The Soil Conservation Service was in the process of having a full environmental impact statement prepared on the West Branch of the Westfield project. The draft environmental impact statement on Washington Mountain Brook was completed in December, 1976. Finally, preparations for an environmental assessment on Baiting Brook in the Su As Co Watershed were in progress at the end of FY 77.

At the Moose Hill Site, the salvaging of historically significant materials was under way at the close of the fiscal year.

Watershed Construction Progress Report

Su As Co Watershed

The Millham Dam Phase repairs of the Tyler site were completed in August, 1976. Land rights operations and negotiations are continuing. The bid for the annual maintenance contract was awarded to the low bidder. The Ross site vegetation and stabilization work are ongoing.

Quaboag River

Land taking documents were being prepared at the end of FY 77 on the Moose Hill Reservoir Site. The low bidder was awarded the annual maintenance contract.

Clam River

Construction proceeded on schedule for the Clam Lake Site. The annual maintenance contract was awarded and meetings with the Assistant Attorney Generals from Eminent Domain are taking place.

West Branch - Westfield River

Land rights operations and meetings on the eleven sites of the watershed are in progress.

Washington Mountain Site

The clearing of site was completed during FY 77. The other two construction sites are now in progress.

Massachusetts Water Watch Program Progress Report

All of the towns, excepting Rowley, participating in the program have failed to report any measurements to the Division during FY 77. Rowley's sites are operating and reporting measurements promptly.

National Flood Insurance Program

As the state coordinating agency for this program, we have been involved in fostering participation, setting priorities for rate studies and working with consultants performing the rate studies.

There are 312 communities presently participating in the program. Twenty-five (25) communities are in the regular program and the remaining 287 communities are in the emergency program. There are five communities which have been suspended for failure to adopt the required land use control measures, They are Tewksbury, Brookline, Mansfield, Gardner and Truro.

This Division, in cooperation with the regional office of the federal insurance administration, is working with the Massachusetts Building Code Commission in an attempt to revise the state building code to conform to the minimum building requirements of the federal regulations.

Forty-two flood insurance rate studies were assigned to contractors during FY 1977. We have long sought to have such contracts let on a river basin basis and are gratified by the fact that this method is now most often used. Another staff recommendation has been the use of accurate topographic mapping employing orthophotogrammetric methods. The contractor working in the Nashua Basin will utilize and enlarge upon such accurate topographic mapping provided by this Division, pursuant to our own wetland restriction program. In developed areas, we hope that two foot contour base maps will become a basic water resources planning tool. (See figure 4).

- Regular Program Communities -

Bedford
Bourne
Dennis
Duxbury
Fairhaven
Falmouth
Heath
Holbrook
Marion
Mattapoisett
Nahant
Needham
New Bedford
Newbury
Norfolk
Provincetown
Quincy
Salem
Somerset
Swampscott
Swansea
Westport
Winthrop
Westwood

Cooperative Flood Hazard Studies

Clam River

The draft report of the Clam River Watershed in the Town of Sandisfield was completed and is in review. Flood frequency elevation analysis, flood profiles, and flood plain delineation maps were constructed for Clam River, Buck River and Silver Brook. Final report is expected in mid-FY 78.

Upper Quaboag River

Completion of the final report for the watershed is expected by March, 1978. Major streams studies are: Mill River, East Brookfield River, Sevenmile River, Turkey Hill Brook, and Cranberry River. The watershed is located primarily in the Towns of New Braintree, Oakham, Rutland, West and North Brookfield, Brookfield and East Brookfield, Spencer, and Paxton.

Floodplain Information Reports

Town of Easton

The U. S. Army Corps of Engineers completed a flood plain information report involving the major streams in the Town of Easton The report contains profiles based on the floods of February, 1886, March, 1936, September, 1938, August, 1955, and March, 1968.

North Nashua River

Flood plain information reports covering the North Nashua River in the city of Fitchburg and the Town of Leominster were completed by the Army Corps of Engineers. The report highlights a summary of historical floods and provides profiles based on the floods of March, 1936, September, 1938, October, 1956, June, 1944, and September, 1954.

Millers River and North Branch

A flood plain information report was completed for the Millers River and North Branch in the Town of Winchendon by the U. S Army Corps of Engineers, New England Division. A summary of historical floods and flood profiles was based on the floods of March, 1936, and September, 1938

RAINFALL (in inches) 1976

	State	Northeast Section	Southeast Section	Central Section	Conn. River Section	Western Section
January	5.10	4.67	5.85	5.60	5.62	4.72
February	2.83	2.74	2.46	2.83	3.44	3.13
March	2.92	2.62	3.66	2.82	2.80	3.40
April	2.47	2.34	1.49	2.86	4.05	2.94
May	3.48	2.71	2.61	3.38	5.39	5.30
June	1.56	0.84	1.46	1.50	2.89	3.96
July	3.79	4.61	4.76	3.20	2.90	3.84
August	6.85	5.79	8.18	6.17	8.27	6.89
September	2.16	2.13	1.83	1.98	2.55	3.22
October	4.46	4.30	6.18	4.91	5.22	4.70
November	0.87	0.72	1.18	0.82	0.83	0.73
December	3.09	3.18	3.32	3.15	2.44	2.28
Year	39.58	36.65	42.98	39.22	46.45	45.11
Normal	44.05	42.58	44.32	44.33	44.65	45.15

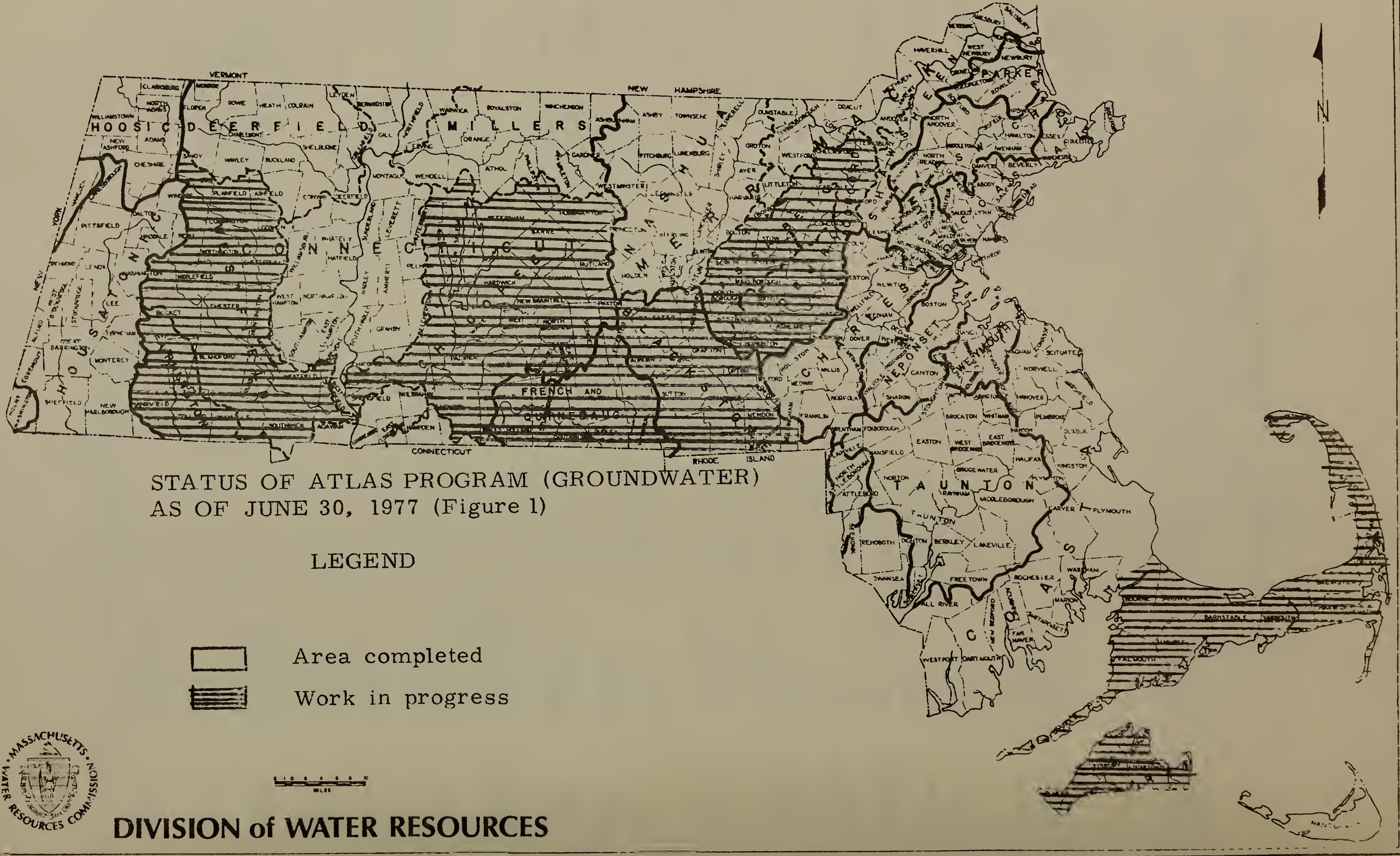
RAINFALL EXCESS OR DEFICIENCY (in inches) 1976

	State	Northeast Section	Southeast Section	Central Section	Conn. River Section	Western Section
January	+1.61	+1.09	+2.05	+1.92	+2.35	+1.57
February	-0.48	-0.67	-1.19	-0.68	+0.32	+0.23
March	-0.86	-1.17	-0.52	-1.20	-0.85	-0.03
April	-1.11	-1.26	-2.49	-0.83	+0.48	-0.75
May	-0.18	-0.62	-0.79	-0.11	+1.46	+1.37
June	-1.98	-2.50	-1.76	-2.19	-1.07	-0.26
July	+0.14	+1.16	+1.79	-0.28	-1.25	-0.63
August	+2.84	+2.17	+4.19	+2.55	+4.26	+2.60
September	-1.61	-1.46	-1.92	-1.84	-1.34	-0.97
October	+0.98	+1.05	+2.76	+1.65	+1.78	+1.34
November	-3.02	-3.19	-2.66	-3.28	-3.10	-3.15
December	-0.80	-0.53	-0.80	-0.82	-1.24	-1.36
Total Excess	+5.57	+5.47	+10.79	+6.12	+10.65	+7.11
Total Deficiency	-10.04	-11.40	-12.13	-11.23	- 8.85	-7.15
Total Excess pr Deficiency for Year	-4.47	-5.93	- 1.34	- 5.11	+ 1.80	-0.04

REGISTER OF PUBLIC LAW 566 WATERSHEDS
MASSACHUSETTS
January 1975

Name of Watershed	County	Sponsors	Size (Acres)	Date of Application	Date of State Approval (Application)	Date of Planning Authorization	Date of State Legislation	Date Work Plan Completed (Signed by Sponsors)	Date of Operation Approval
BATTING BROOK	Middlesex	Middlesex C.D.	2,182	11/26/56	12/10/56	1/8/57	7/13/72	4/25/57	8/30/57
BLACKBERRY RIVER	Berkshire, Ma.; Litchfield, Ct.	Berkshire C.D., Ma. Conn. Commissioner of Agriculture & Natural Resources	7,600	12/11/56	—	—	8/20/59	10/15/58	8/31/59 1/30/61 6/11/65
BRADLEY BROOK	Hampden	Hampdan C.D. Town of Russell	6,970	12/5/60	2/13/61	4/23/62	6/28/63 8/3/67	4/3/63 3/5/68 7/23/68 7/15/69	12/19/63 3/14/68 2/ 7/29/68 2/ 7/18/69 2/ 12/21/70 2/ 10/20/71 2/
BROAD BROOK	Hampden Hampshira	Hampden C.D. Hampshire C.D. Town, Easthampton	7,578	8/13/58	10/27/58	8/15/61	7/23/63	4/9/63	12/19/63
CLAM RIVER	Berkshire	Berkshire C.D. Mass. WRC	20,065	4/6/59	5/11/59	6/17/60	7/25/63 7/19/68	7/27/63 3/9/65 3/24/67 3/24/70	12/19/63 3/12/65 2/ 9/15/67 2/ 4/9/70 2/ 5/18/73 2/
COLD RIVER	Berkshire Franklin	Berkshire C.D. Franklin C.D.	19,904	3/3/64	4/13/64	—	—	—	— 4/
DANFORTH BROOK	Worcester	NW Worcester C.D.	3,480	6/6/63	7/8/63	—	—	—	— 4/
DIAMOND BROOK	Norfolk	Norfolk C.D. Town of Walpole	1,270	1/27/64	6/24/64	2/12/68	9/2/66	**2/24/76**	**9/29/76**
FURANCE BROOK 5/	Hampden, Ma.; Tolland, Conn.	Hampden C.D., Ma. Conn. Com. of Agri. & Natural Resourcas	33,326	4/56	—	—	—	7/2/58	8/20/58 6/30/65 2/
GREEN RIVER	Berkshire	Berkshire C.D.	27,315	10/1/65	10/11/65	—	—	—	-- 3/
HUDSON BROOK	Berkshire, Ma.; Bennington, Vt.	Berkshire C.D. Bennington C.D.	4,886	12/18/63 1/20/64	2/10/64	—	—	—	-- 4/
IPSWICH RIVER	Essex Middlesex	Essex C.D. Middlesex C.D.	86,000	6/10/63	6/12/63	—	—	—	— 3/
KONKAPOT RIVER	Berkshire, Ma.; Litchfield, Conn.	Berkshire C.D. Conn. Com. of Agri. & Natural Resources	41,700	3/16/60 3/28/60	3/14/60 3/30/60	—	—	—	—
LITTLE RIVER	Essex	Essex C.D. City of Newburyport	6,030	10/26/62	11/15/62	6/24/63	—	12/[illegible]/67	Term.
MILL RIVER	Franklin Hampshire	Hampshire C.D. City of Northampton Town of Williamsburg	37,760	5/11/70	7/13/70	—	—	—	-- 3/
MONATIQUOT RIVER	Norfolk	Norfolk C.D.	17,760	4/8/57 8/27/63 1/	6/13/57	2/27/58	—	6/27/59	Term.
MUNN BROOK	Hampden	Hampden C.D.	14,100	5/8/61	6/12/61	—	—	—	---
PINE TREE BROOK 5/	Norfolk Suffolk	Norfolk C.D. Town of Milton	5,184	11/6/63	1/2/64	9/19/66	9/21/65	5/16/68 1/26/70	6/3/66 2/2/70 2/ 4/30/71 2/
POWDERMILL BROOK 5/	Hampden Hampshire	Hampden C.D. City of Westfield	12,825	3/7/60	4/12/60	4/14/61	4/9/62	10/26/61	11/15/61
SMELT BROOK	Norfolk	Norfolk C.D.	1,540	4/8/57 8/27/63 1/	6/13/57	2/27/58	—	2/12/59	Term.
SOUHEGAN RIVER	Middlesex, Ma.; Hillsborough, New Hampshire	Middlesex C.D., Ma. Hillsborough SCD, NH N.H. Water Res. Bd. N.H. Fish & Came Town of Graenville, NH Town of Milford, NH	109,440	5/21/58	—	---	---	5/3/61	9/8/61 1/66 2/ 9/69 2/
SUASCO	Middlesex Worcester	Middlesex D.C. NE Worcestar C.D. Mass. WRC Mass. DF&W Mass. DNR	241,617	8/8/55 11/26/56 1/	9/13/55 12/10/56	11/17/55 10/1/65	9/26/60 6/10/64 12/28/65 8/21/70	3/25/59 11/25/64 5/25/67 2/12/68	8/31/59 9/10/65 2/ 5/26/67 2/ 2/14/68 2/ 5/5/72 2/
TEN MILE RIVER	Bristol Norfolk, Ma.; Providence, RI	Bristol C.D. Norfolk C.D. SERPEDD, Ma.; N. Rhode Island C.D.	41,300	11/29/71	2/14/72	9/26/73	—	—	—
TOWN RIVER	Norfolk Bristol Plymouth	Norfolk C.D. Plymouth C.D. Bristol C.D.	34,560	6/21/55	—	9/9/55	—	7/14/68	Term.
TRAPHOLE BROOK	Norfolk	Norfolk C.D. Town of Walpole	1,207	3/30/64	7/24/64	2/12/68	8/19/70	—	—
UPPER QUABOAG RIVER	Hampden Hampsnire Worcester	Sc. Worcester C.D. NW Worcester C.D. Town E. Brookfield Town of Leicester Mass. WRC	9[illegible],301	2/28/58	3/10/68	9/11/59	6/19/62 7/10/68 7/15/70	5/31/61 6/28/63 11/12/68	8/23/61 6/29/63 2/ 12/9/68 2/ 5/8/75 2/ 9/20/75 2/
WASHINGTON MOUNTAIN BROOK	Berkshire	Berkshire C.D. Town of Lee Mass. DNR	5,740	1/12/61	2/13/61	6/24/63	7/17/68	10/2/66 12/23/69	4/1/69 12/31/69 2/ 7/10/71 2/ 5/18/73 2/
WEST BRANCH WESTFIELD RIVER	Berkshire Hampden Hampshire	Berksnire C.D. Hampden C.D., Mass. DNR, Hampshire C.D.	60,800	5/13/60	6/13/60	6/14/65	7/16/68 8/11/69	9/10/69	10/9/70 11/15/71 2/
WEWEANTIC RIVER	Plymouth	Plymouth C.D.	39,843	7/17/59 8/13/68 1/	9/14/59 10/24/68	—	—	—	— 3/

1/ Amendment to Application. 2/ Supplement Approval Date. 3/ Inactive. 4/ Application Withdrawn. 5/ Project Completed.



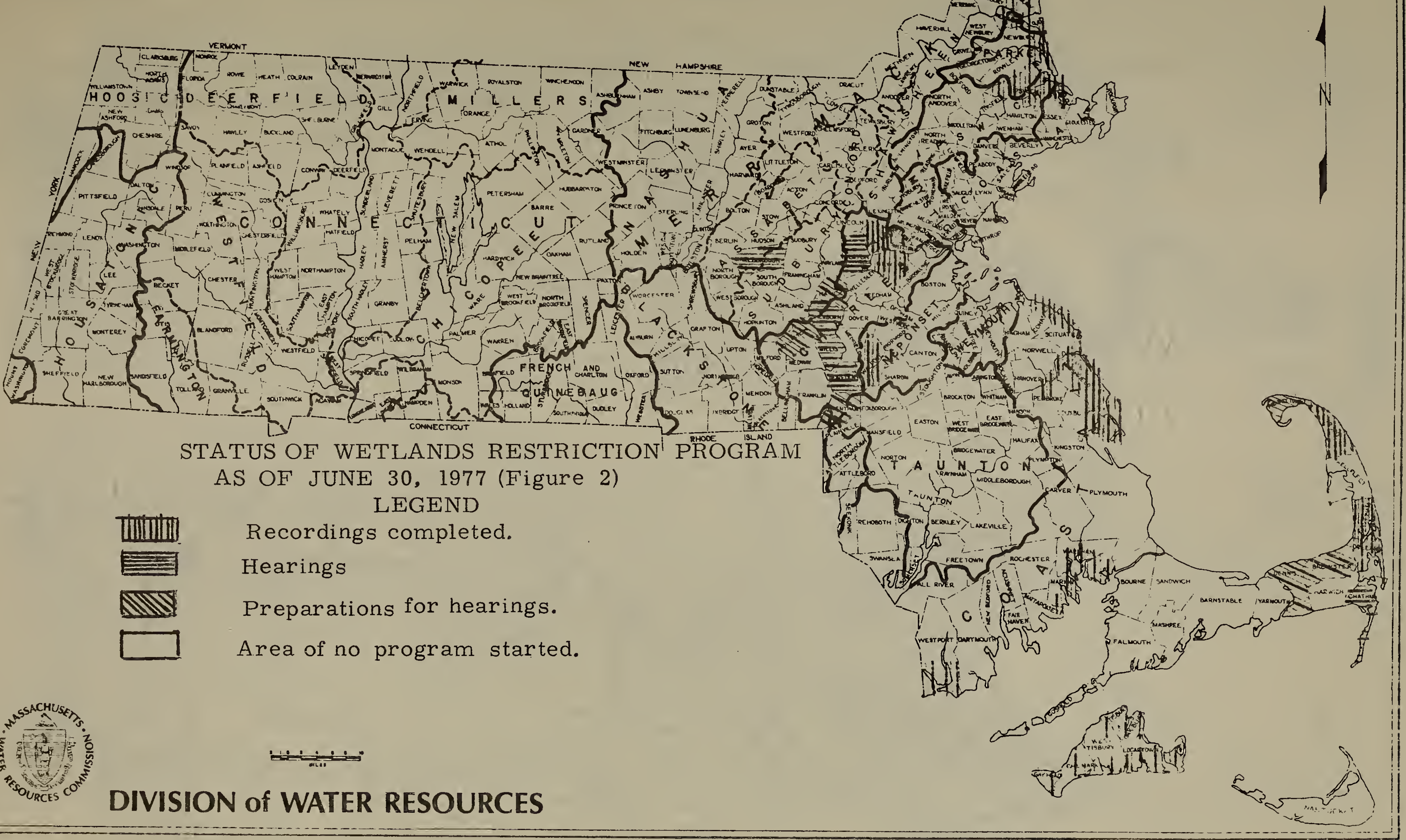
STATUS OF ATLAS PROGRAM (GROUNDWATER)
AS OF JUNE 30, 1977 (Figure 1)

LEGEND

☐ Area completed

▤ Work in progress

DIVISION of WATER RESOURCES



STATUS OF WETLANDS RESTRICTION PROGRAM AS OF JUNE 30, 1977 (Figure 2)

LEGEND

- ▥ Recordings completed.
- ▤ Hearings
- ▨ Preparations for hearings.
- ☐ Area of no program started.

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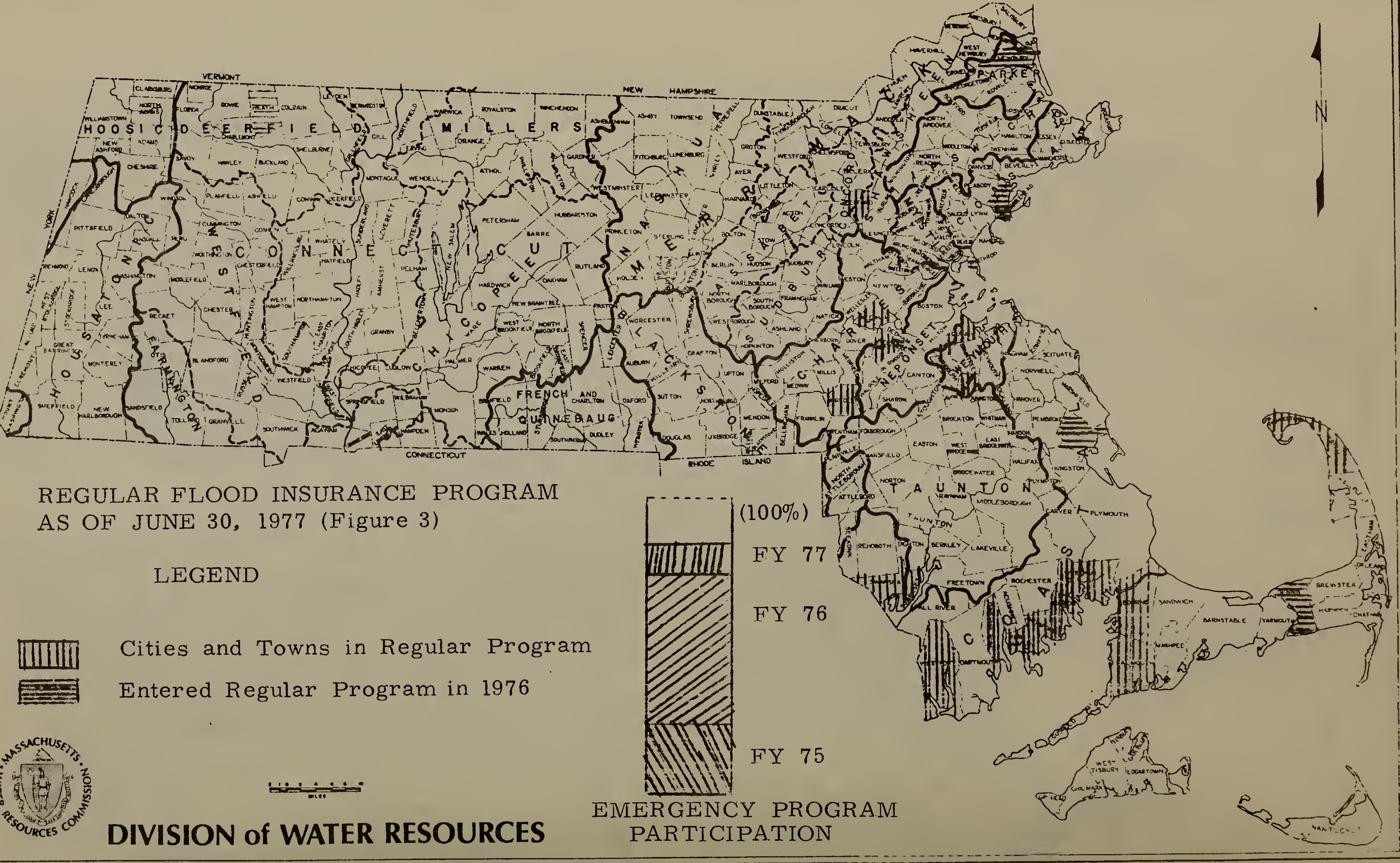

REGULAR FLOOD INSURANCE PROGRAM
AS OF JUNE 30, 1977 (Figure 3)

LEGEND

▥ Cities and Towns in Regular Program

▤ Entered Regular Program in 1976

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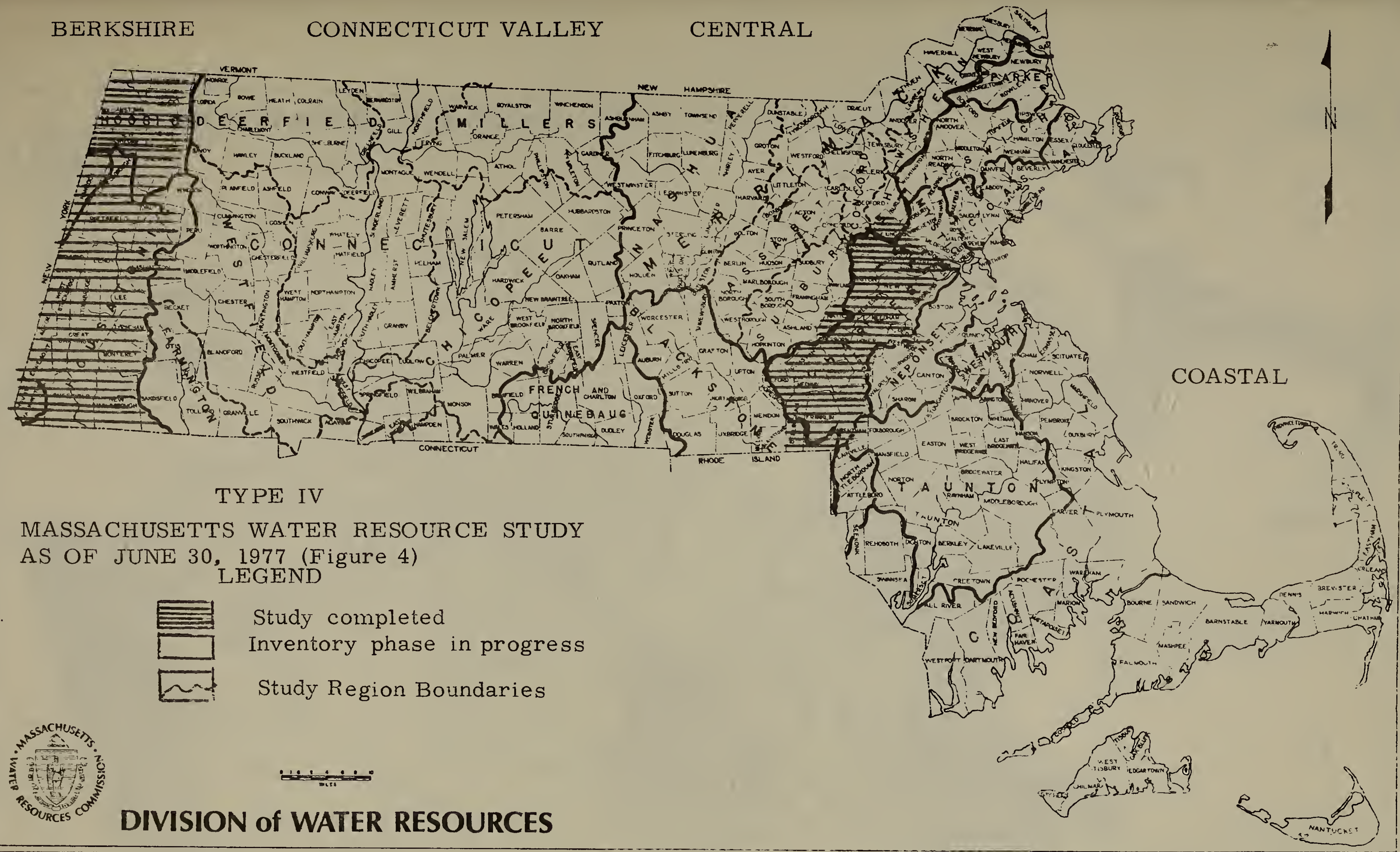

TYPE IV

MASSACHUSETTS WATER RESOURCE STUDY
AS OF JUNE 30, 1977 (Figure 4)

LEGEND

- ▤ Study completed
- ☐ Inventory phase in progress
- 〰 Study Region Boundaries

MASSACHUSETTS WATER RESOURCES COMMISSION

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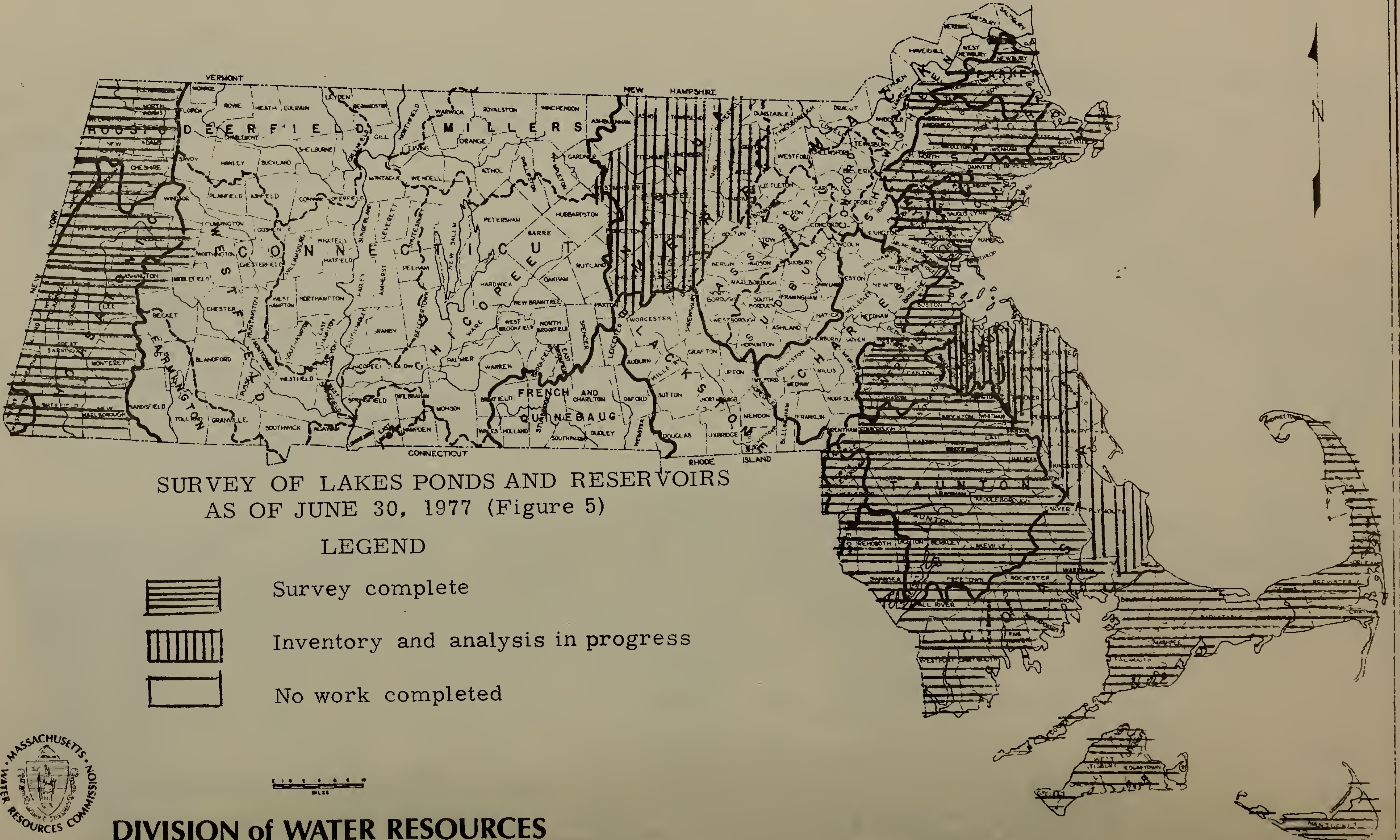

SURVEY OF LAKES PONDS AND RESERVOIRS AS OF JUNE 30, 1977 (Figure 5)

LEGEND

▤	Survey complete
▥	Inventory and analysis in progress
☐	No work completed

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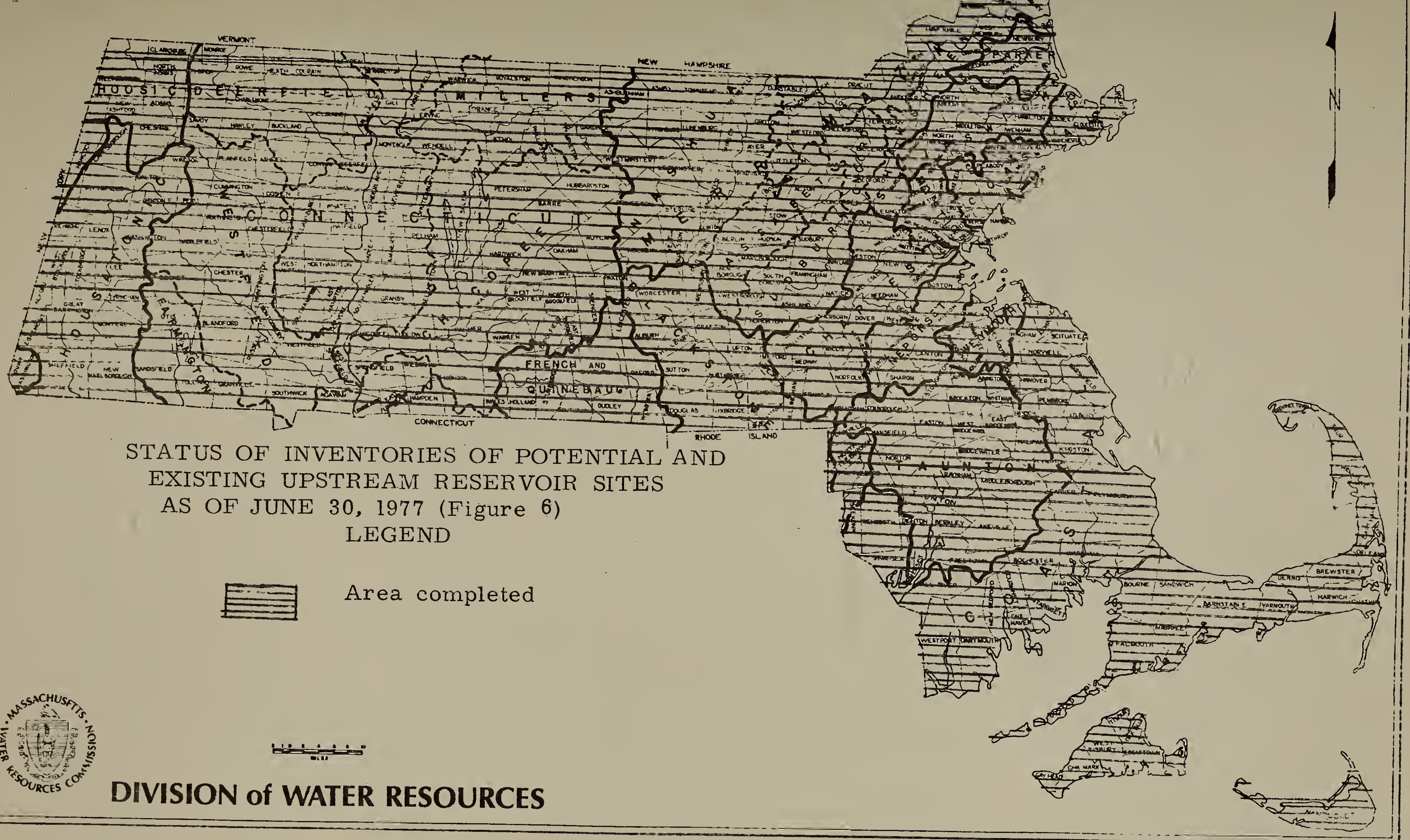

STATUS OF INVENTORIES OF POTENTIAL AND EXISTING UPSTREAM RESERVOIR SITES AS OF JUNE 30, 1977 (Figure 6)

LEGEND

▤ Area completed

DIVISION of WATER RESOURCES

Annual Report

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

WETLAND RESTRICTION

Prepared by Director Meriel Hardin

Fiscal year 1977 can best be characterized as the "coming of age" of of the Wetland Restriction program, The process has been partly an "operation bootstrap" but not entirely, for we have had good support and cooperation from others.

On June 30, 1976, a director, appointed by Commissioner Woody, was added to the staff. Some needed changes were apparent from the start, namely 1) the staff needed to be reorganized into an efficient team as we moved from a staff of two field people plus draftsman to five field personnel plus draftsman, clerk-secretary, legal counsel, technician and director, 2) a need to improve our finished product for recording purposes, 3) we were not implementing the flood plain provision of G.L. 131/40A, and wanted to find a way to do this, and 4) we needed to produce wetland mapping that would meet the needs of the local conservation commissions in their implementation of G.L. 131/40.

Additional problems surfaced as the work progressed .. 1) we needed to work with other agencies in an attempt to avoid duplication of effort and, where possible, to help supply their needs, particularly the DEQE wetlands program and Coastal Zone Management policy, 2) we needed to work hard on our public relations ... to listen to our critics, from within the professions concerned with our work, and from the legislature, the local officials and landowners, 3) even with staff reorganization we were still moving along at a snail's pace and would need to find a way to streamline the restriction process and if possible find funding for additional staff.

There is still much to be done to improve our efficiency but we have come far in one year.

Staff Reorganization

The main objective was to assess each person's skills and strengths and to put them to use to the best advantage of the program as well as to enhance each person's enjoyment in and commitment to the particular work he or she is doing.

During the year an attorney on the staff, who had been functioning as a land use administrator, was moved into a counsel position. This filled two needs. We needed more staff and the move allowed us to hire a new field person in the vacated slot. We also very much needed a full time counsel to handle contracts, to be responsible for the mass of land court and registry work, to handle our end of any suits, to answer questions of attorneys representing landowners and to explain the laws and the Order at our public hearings.

One staff member has been assigned to provide data on wetlands, water supply and soils, to plot drainage systems and wetlands on topographical maps, to assist counsel with recording and assessors' records, and if needed to assist the field staff out in the field.

In December we were able to employ a secretary after months of having to beg help or do it ourselves. This has been a tremendous help as she answers the phone, does the typing and filing and is proving to be a super sleuth at tracking down information. Another backup person is the draftsman

who has been with the program for several years. We depend on him to prepare plot plans, make changes in maps, make charts and carry out the graphics chores.

Three field people are assigned to work on inland wetlands -- one is responsible for the Nashua River project, one is doing the upper and some middle Charles River towns and the third is doing middle and lower Charles communities. Two staff members are assigned to work in coastal communities, at present in Barnstable County, implementing both the inland and coastal restriction Acts. Each of the five field people is responsible for his or her areas. All can and do call upon the back-up personnel for assistance and all are directly responsible to the director. One land use administrator, hired in December, is proving especially talented in reviewing proposals and writing the scope of work for contracts. The need for other special assignments is becoming apparent, particularly in the areas of accounting and budgets.

Detailed job descriptions for each person are being prepared. These are to fit the particular job being done for this program and will take into account the abilities of each individual. Such descriptions, in writing and agreed upon by both the individual and director, will be used as a standard from which to evaluate each staff member's contribution. All staff will also know exactly what they are responsible for.

Some staff development has been promoted by holding four educational field days. These included 1) in Marlborough with David Grice in charge, learning orienteering with aerial photos and topographical sheets and evaluating wetlands, 2) at Parker River State Park with a soil scientist from SCS giving us practice in assessing wetland soils, 3) at Audubon's Sanctuary in Natick with Bruce Lund, botanist and biologist, giving us practice in recognizing wetland plants and particularly in knowing a community of plants, 4) in Hopkinton with Gary Hollands, geologist and photogrammetrist and Dennis McGee, botanist, orienteering with topo sheets, practicing evaluation of wetlands and determining boundaries by vegetation and geology of an area.

The inland program is progressing quite well with three people working on it. Additional contributions were made by a staff person (now working on Scenic Rivers) who brought one town through the public hearing phase and by the director who assisted on one town and then brought another through the field checking stage by the end of June. The present staff should be able to do about fourteen towns in the coming year.

The coastal program at present is weak. There are only two people working on it and they seem to be bogged down in masses of assessor sheets. It appears that new personnel will be needed to inject some enthusiasm into the work in Barnstable County. At the moment of writing it appears this may happen through Coastal Zone Management funding.

The Problems of the Flood Plains

In 1974 a paragraph calling for restriction of flood plains was added to the Inland Wetland Act. By the beginning of fiscal '77 this section was still not being implemented. At that time the only inland towns being worked on were along the Charles River. We explored the resources of the Army Corps of Engineers, the HUD flood insurance project and the maps of the U.S. Geological Survey. We looked at M.A.P.C. resources, the SENE reports, and investigated what information the watershed associations could locate. We found none of these sources could provide what we needed for

the whole river nor in sufficient detail.

But we did discover that a federal grant had provided funding for a project on the main stem of the Nashua. Orthophoto maps and line and symbol maps had been prepared with 2-foot contours and the line of the 1936 flood. The Nashua River Watershed Association and the conservation commissions were most anxious to have these maps put to use.

After consulting with Charles Kennedy, Director of Water Resources, and three attorneys, Santos Ruma, Alexandria Dawson and Gregor McGregor as well as the Environmental Division of the Attorney General's office, and after great consideration we decided to go ahead with just the wetland mapping in the Charles. The Corps Natural Valley Storage areas would protect the largest areas of flood plain and our implementation of the law would wait until the HUD maps were complete and the Corps' land purchases were made.

As for the Nashua, we decided to go ahead and restrict both the wetlands and the flood plains. It appeared highly unlikely that we would ever have better mapping and it was certainly wise to try out the program with top quality mapping. Fiscal 1978 will see the implementation of the first restrictions on flood plains.

The Problems of Producing a Wetlands Map for Conservation Commissions

Conservation Commissions throughout the State need an accurate wetlands map, or at least a set of aerial photos with the wetlands delineated on them. Some towns were voting two or three thousand dollars for mapping. The results were far from accurate. Some towns tried mapping by volunteers. This process took a formidable amount of time. But either way, it was better than nothing.

The particular bond money our program uses is described as being for "mapping of the wetlands of the Commonwealth." The director interprets this to mean, mapping all wetlands in such a way that it will be useful not only to us but to DEQE's wetlands program and the local communities.

Contractors are instructed to map all wetlands by vegetation for the Inland Act and by vegetation and geological formation for the Coastal Act. And they are to include everything down to a quarter of an acre. This is now being done.

Our staff will check these out and make selections for restriction. The map going to the town will show all wetlands and those restricted will be conspicuously numbered and be accompanied by a key giving characteristics. Commissions will know just what their responsibilities are for any wetland.

The problem of course is that we have finished so few towns that most commissions will have to wait too long for our product and will probably try to get mapping on their own.

Improving Our Products

On November 17 we held an all day workshop session in an attempt to get some new ideas on how to improve our mapping. We invited other agency people and also all engineering firms and planners who expressed an interest in attending. The experience proved valuable in that it gave us the opportunity to meet many of the contractors who would be responding

to our next requests for proposals. It also brought out two problems:

1- The contractors proved reluctant to divulge their best ideas in the presence of competitors.

2- Severe criticism of our mapping by the Mass. Association of Land Surveyors and Engineers (MALSCE) came out in this public forum.

Several members of MALSCE had met with the director on an earlier occasion and had expressed their dissatisfaction with the accuracy of our mapping product. They subsequently wrote a letter of criticism to the director and sent copies to a number of heads of governmental agencies, to the governor, to all registrars of deeds and to all cities and towns. We were already searching for new mapping methods so this criticism proved to be timely and helpful.

During early 1977 the staff began discussions with representatives of MALSCE as well as with individuals with expert knowledge of mapping techniques and costs, with an eye to asking for an improved product in our next RFP.

In March, a contract was signed with Mr. Lester Garvin of Resource Mapping Systems Inc. to complete mapping of Natick and Wrentham, Holliston and Hopkinton. As Mr. Garvin had already mapped the Charles River portion of Natick and Wrentham for this program while working for Raytheon, and had served as a consultant to Hopkinton in their wetland mapping project, he was awarded this small contract without an RFP. Holliston had also been engaged in a wetland mapping effort, and were willing to let us adapt their materials to our program, so they were included in this contract of partially completed towns. (We have tried where possible to work cooperatively with local towns, sharing materials and expertise, but are finding that it often adds greatly to the difficulty of the task and the time needed to accomplish it.)

As a result of our continuing discussions with mappers and engineers, it was written into this contract that mylar maps, used for recording at the Registry of Deeds, should be based on the Mass. Coordinate System, and should include a good deal more cultural detail, especially in the immediate vicinity of the wetland areas, than had been drafted onto our previous maps.

Meanwhile, in early February, a Request for Proposals for mapping 5 towns in the Charles River Watershed and another covering 10 towns in the Nashua River Watershed, were sent out to 14 firms who had sent us their qualifications. The RFP's specified the use of presently available DPW photography for delineation, improved maps based on the Mass. Coordinate System, and the drafting of a considerable amount of cultural detail to facilitate local orientation. They did not specify that the maps should meet national map accuracy standards, as our early discussions had led us to believe that the techniques needed to produced such maps would be beyond our means.

When the proposals arrived, it was found that a few firms had included alternate proposals that involved materials and techniques not called for in the RFP. At least two of these offered methods of achieving a base map meeting national map accuracy standards at a reasonable cost. Since alternative proposals had not been requested, it was impossible to accept any of these proposals without allowing all the firms who had responded an opportunity to submit a second proposal. Therefore, the old RFP proposals were put aside, and a new RFP was sent out adding the tasks of 1) obtaining new controlled photography and 2) production of a 1"=600' base map meeting national map accuracy standards.

Eight firms responded to the second Charles River RFP, and seven to the Nashua River RFP. In both cases, Resource Mapping Systems Inc. submitted the least costly proposal, considerably less than any other that would produce a comparably accurate end product. For that reason, they were awarded both contracts, though we had originally hoped to be in a position to try two dissimilar techniques.

The two contracts were approved April 11, and work on the aerial photo interpretation began immediately. New controlled photography was taken in late April, producing contact prints at a scale of 1"=3000', which are a great help in checking for changes in the areas. The negatives were used to produce orthophoto base maps at a scale of 1"=600', on to which wetland boundaries are transferred. (An orthophoto is a photograph, but the computerized printing process eliminates horizontal distortion, so the resulting corrected photo meets national map accuracy standards.) The mylar orthophotos should be ready in early September, after which Resource Mapping will begin transferring wetland boundaries to them. Copies of the finished product will be made for each community.

Local officials and landowners should be pleased with the increased accuracy and usefulness of these maps. The Registry of Deeds, which will not accept the orthophoto as a recording document, will receive a line and symbol map made from the orthophoto, and also meeting national map accuracy standards.

In May, 1977 the director spoke at the luncheon meeting of MALSCE's Proprietors Group and described how we were improving our mapping process and the product. The engineers were pleased to hear of our efforts and have promised their cooperation and assistance in our work.

By the end of the year we had met our mapping objectives: 1) we had an improved recording instrument 2) we would be able to give each community a useful wetland map and 3) we had a start on the demands of our critics.

Working With Other Agencies

We have tried to make our program fit well within the work of other agencies, particularly to avoid duplication of effort and to ensure that what we do is useful to them.

In the course of pursuing this goal, the director and staff have met with a number of other agency people and have searched for materials that might be useful in meeting our needs. Some agencies who have been particularly helpful are the Office of State Planning, Dept. of Community Affairs, Dept of Housing and Urban Development, Dept. of Food and Agriculture, Dept. of Fish, Wildlife and Recreational Vehicles, Dept. of Environmental Quality Engineering, Coastal Zone Management and all of the Divisions within the Dept. of Environmental Management.

Everyone has been helpful in every way request of and all have expressed the desire to work with us in our mutual interest. In this report two of these cooperative ventures are described.

Commissioner David Standley of DEQE asked the director to serve as DEM's representative on the DEQE Program Review Board. Commissioner Evan Dobelle, then commisioner of DEM, agreed to this assignment. Meetings were held on a regular basis from February through June. More meetings will be necessary as we try to work out exactly how DEM's wetland delineations will fit together with the work of DEQE's Wetlands protection program.

The development of Coastal Zone Management policy during the year necessitated our taking a serious look at our implementation of the Coastal Wetland Act. It was essential that CZM have a good understanding of what we are doing and what we could do under the law in order to insure that their plans for us would fit within our capabilities. We have reworked parts of our Orders somewhat and have enlarged the scope of the program to include additional areas, particularly unstable dunes, salt marshes and sandy beaches. The dunes, though not wetlands, are included in the law's first paragraph "and such contiguous land as ... reasonably .. necessary .." to carry out the purposes of the law.

In the next fiscal year, as the CZM plans are implemented, the Wetland Restriction program will undergo considerable further change. We will need to enlarge the staff and improve our efficiency if we are to carry out CZM policy in a reasonable period of time.

Public Relations

Public relations is becoming one of the most essential efforts in the whole program. As we enlarge the staff so we can work in pursuing the restrictions with renewed vigor and in communities where more vocal opposition is encountered, we are receiving more press coverage. We are now being asked for information on the phone, by mail, by personal interview and through meetings and speeches. The word is out now that we are an ongoing program and that we mean business. The bulldozers no longer look on us as the program that won't be done for 500 years. We are very much here.

One result of our increased visibility is a demand for our services. Conservation Commissions, in particular, want to know how soon we can come to their communities. We have also had requests from legislators, other agencies and the public. One request came from a planner who was writing an open space plan for a coastal community.

On the other hand, opposition is also evident. Many local officials, particularly selectmen and city councillors and some legislators feel we are imposing a state program on local communities without their consent. It is not surprising they would feel this way. The provisions of 131/40A make it painfully apparent that this is exactly what the law is doing. The law provides that we submit our Order to the selectmen or council for their approval. If they disapprove and state their reasons in writing within 30 days, implementation is held up for six months, but at the end of that time it goes into effect. The Marlboro City Council filed a bill that would delete from the law the phrases that allowed the recording process to go ahead after 6 months. They felt their decision should be final. On the contrary, we feel it would be more consistent if we did not ask for approval. This is not required in the Coastal Wetland Act, and should be eliminated from the Inland.

In any event, whether the laws are amended or not, it is essential that we work continuously to improve our relationship with legislators, local officials and the landowners. More meetings at the convenience of local officials are imperative. We must be able to sell the program to them before the public hearing. This means they must understand what the program means to their communities so they can ask questions and raise any objections early in the process. This will allow us to work out solutions before the hearing and perhaps avoid some of the criticisms.

We have been seeking ways to improve our hearing presentation and will continue to do so. Our staff is available for on-site visits with landowners and for any help the community needs to work out an Order that meets local needs.

Another area of improvement is the product we give the town. We want to provide a wetland map that can be used by the Conservation Commission in their administration of 131/40 and one that will provide the assessors with the tool to reassess restricted land.

Milestones for Fiscal Year 1977

Recordings Completed (2)

Orleans September 16, '76

Newton April , '77

Hearings (7)

Newton	September 15	recorded
Marlborough	September 30	approved, recording in process
Millis	November 22	approved " " "
Norfolk	January	approved " " "
Chatham	February 18	
Weston	June 8	no action by June 30
Sherborn	June 14	no action by June 30

In preparation for hearings, June 30, 1977

Provincetown
Dennis
Brewster
Holliston
Hopkinton
Natick
Wrentham

Goals for Fiscal Year '78 with present staff

Recordings Completed (15)

Marlborough
Millis
Norfolk
Chatham
Weston
Sherborn
Provincetown
Brewster
Holliston
Hopkinton
Natick
Wrentham
Bolton
Harvard
Dennis

Hearing During Fiscal Year '78 (16)

Provincetown
Dennis
Brewster
Sandwich
Harwich
Holliston
Hopkinton
Natick
Wrentham
Lexington
3 additional Charles River towns
Bolton
Harvard
Pepperell
1 additional Nashua town

In Preparation for Hearings (7)

Medfield
2 additional Nashua towns
2 additional Charles River towns
Wellfleet
Bourne

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